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LITHOGRAPHIC ABSTRACTS are published monthly in the trade press. Because of the exigencies of magazine publication, a complete set of abstracts cannot be had from one source. For this reason, and for the convenience of the lithographic industry, annual publication commenced with the 1947 issue. The months *September, 1951* through *July, 1952* are included in this issue. Plans are underway to publish Lithographic Abstracts prior to 1947.

Abstracts of important current articles, patents, and books are compiled by the Research Department of the Lithographic Technical Foundation, Inc. These abstracts represent statements made by the authors of articles abstracted and do not express the opinions of the abstractors or of the Research Department. Mimeographed lists have been prepared of (1) *Periodicals abstracted by the Department of Lithographic Research,* and (2) *Books of interest to lithographers.* Either list may be obtained for ten cents in coin or U.S. stamps. Address the Lithographic Technical Foundation, Inc., Research Dept., Glessner House, 1800 S. Prairie Ave., Chicago 16, Ill.

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PHOTOGRAPHIC EQUIPMENT AND METHODS

NEW PHOTOCHEMICAL LAMPS. L. E. Barnes. *Photographic Engineering* 2, No. 2, 1951, Page 77. (From a paper given at the 1950 National Technical Conference, Illuminating Engineering Society.) The author states that new photochemical lamps having a more uniform and a higher ultra-violet output have been developed using a new glass and electrodes. The lamps utilize a medium pressure mercury arc and are especially adapted for use with the modern Diazo white-print machines.

* COMPARISON TYPE DENSITOMETER AND ELECTRONIC MEASURING CIRCUIT THEREFOR. *U. S. Patent 2,561,243.* Monroe H. Sweet. *Official Gazette* 648, No. 3, July 17, 1951, Page 926. 1. A logarithmically responsive electronic measuring circuit comprising, in combination, electrically energized light flux source means having a light flux, output logarithmically related to the electrical energy input; light flux responsive means arranged to receive light flux from said source means through an interposed sample having a logarithmically varying characteristic and also directly from said source means; electrical means, including indicator means effective to indicate, on a uniformly graduated scale, the value of such characteristic, in circuit relation with said source means and a source of electrical energy, and operative to vary the energizing of said source means to balance the light incident directly upon said light flux responsive means from said source means with that incident upon said responsive means from said source means through the sample; and light flux balance indicating means in electric circuit relation with said light flux responsive means and operatively responsive to a balance of the light flux incident directly upon said light flux responsive means from said source means with that incident upon said responsive means from said source means through the sample.

* PHOTOGRAPHS MADE WITHOUT WASHING. *AMINCO Laboratory News* 8, No. 5, September, 1951, Page 1. Photographic films and prints can be finished without the customary washing in water in a new process developed by the Army Signal Corps at Fort Monmouth, New Jersey. The process is particularly suitable for military forces in areas where water is scarce. In addition to eliminating the need for water, it decreases the processing time, since it is about ten times faster for films and twice as fast for prints as conventional methods. Specially formulated Amidol developer, a stop bath, and stabilizer solutions are used. The heart of the new stabilizing process is a solution containing thiourea. Water-resistant photographic paper is also used, which reduces drying time. In ordinary methods, films and prints are fixed in a hypo bath to remove unexposed silver salts. In the new process, the thiourea converts the unexposed silver compounds to a light-insensitive form. American Instrument Co., Inc. 8030-8050 Georgia Avenue, Silver Spring, Maryland.

NEW RESOLVING POWER TEST CHART. F. E. Washer and F. W. Rosberry. *Journal of the Optical Society of America* 41, No. 9, September, 1951, Pages 597-600 (4 pages). A new resolving power test chart has been made that embodies the features outlined by Dr. Gardner in an earlier report. A contact print of this chart is made with the aid of a small distant light source and a specially shaped diaphragm moving over the chart at constant speed. The final test chart has a continuous variation in contrast from one end of the target line to the other. This chart is to be used to determine the variation of resolving power with contrast for a given lens with a single exposure. The long lines of the target make it especially suitable for microphotometric examination of the final test images, thus bringing closer an objective method of determining the resolving power of a photographic lens.

* PHOTOENGRAVING SCREEN HOLDER. *U. S. Patent 2,564,934.* Max H. Sussin. *Official Gazette* 649, No. 3, August 21, 1951, Page 748. 1. A photo-engraving camera unit including a screen holder adapted to be positioned in front of a film holder and to hold a screen through which a film will be exposed, a compensating plate holder also adapted to be so positioned, a pair of vertically extending looped chains in generally parallel arrangement to each other and to said holders and to each of which both of said holders are connected, one holder to one run of each loop and the other holder to the other run of each loop so that when one holder is moved one way the other is moved the other way, and means for driving said chains in unison for moving the screen holder from the active position to an inactive position while at the same time moving the plate holder from an inactive position to an active position.

PHOTOGRAPHIC COMPOSITION MACHINES. Edward Gottschall. *American Printer* 132, No. 9, September, 1951, Pages 26-27 (2 pages). This is the second of three articles based on a comprehensive chart and analysis of the photocomposing machine field that will be a feature of the Tenth Edition Graphic Arts Production Yearbook. Discussed in this article are: available typefaces, type size range, kerning, letterspacing, word spacing, leading, letter alignment, and mixing of two or more typefaces.

* AUTOMATIC LENS DIAPHRAGM CONTROL MECHANISM FOR PROCESS CAMERAS. *U. S. Patent 2,570,888.* Willis N. Urie. *Official Gazette* 651, No. 2, October 9, 1951, Pages 558-559. Mechanism for constantly adjusting a camera diaphragm carried by a rotatable lens holder, so as to vary the size of a lens aperture defined by said diaphragm, comprising: a support, a motor, a cam rotated by said motor and having a working surface, a cam follower cooperating with said working surface, and means for transmitting the motion of said follower to said lens holder, comprising an arm attachable to said holder in a position projecting therefrom, a push-pull link connected to said arm, a lever comprising a tubular portion pivoted to said support to provide a fulcrum, and a shaft portion extending longitudinally through said tubular portion and having one end pivotally connected to said link, and a connection between said tubular portion and said cam follower for receiving movement therefrom, the other end of said shaft portion projecting from the fulcrumed end of said tubular portion and manually engageable for sliding said shaft portion longitudinally in said tubular portion and thereby varying the effective length of said lever between said follower connection and said link, said lever being disposed at an obtuse angle relative to said link, whereby a change in its effective length will effect an adjustment of the starting position of said arm and thus the size of said aperture at the beginning of any exposure operation, said working surface being so laid out as to effect the adjustment of said aperture at a speed constantly changing at a rate of change such that for each increment of aperture adjustment there is a transmission of light such as to provide optimum exposure conditions.

DENSITOMETRY. Erwin Jaffe. *Modern Lithography* 20, No. 1, January, 1952, Pages 28-31 (4 pages). A general description of densitometry and how the densitometer can be applied as a control device in the various departments of a lithographic plant.

* PRECISION CAMERA. *U. S. Patent 2,581,591.* Alexander T. Koppe. *Official Gazette* 654, No. 2, January 8, 1952, Page 466. 1. The combination in a camera, of a horizontal camera stand in the form of an H-beam having its web extending horizontally and its flanges directed vertically, photographic apparatus adjustable from one position to another longitudinally on the upwardly directed flanges, and a truss

structure connected to the lower flanges of said H-beam toward the ends of said stand, said truss structure having means intermediately disposed thereon adjustably bearing upon an intermediate portion of said stand for maintaining in horizontal positions the flanges on which said photographic apparatus is mounted.

* PHOTOELECTRIC EXPOSURE CONTROL. *U. S. Patent 2,592,035.* George Jacoby. *Official Gazette* 657, 2, April 8, 1952, Pages 485-6. 1. A photoelectric exposure meter circuit for ascertaining and controlling the setting of correct exposure for photographic pictures comprising a self-generating photoelectric cell which supplies current for the circuit according to the light falling on it, a measuring instrument, resistances connected in circuit relation with the cell and instrument, the resistances comprising two branches connected to one side of the photocell in parallel relation to each other, each branch comprising a plurality of resistances connected together, adjusting means for a plurality of the resistances in each branch, a plurality of exposure control means, a separate adjusting means from each branch being mechanically coupled to each of the exposure control means, the two branches being connected at their opposite ends to each other, and means connecting said ends to the other side of the photocell, said resistance adjusting means being correlated with the exposure factors whereby the adjustment of the resistances causes the instrument to indicate a constant current in accordance with the factors and the light falling on the cell.

* COMPARISON TYPE DENSITOMETER. *U. S. Patent 2,594,514.* Monroe H. Sweet. *Official Gazette* 657, No. 5, April 29, 1952, Pages 1387-8. 1. A comparison densitometer comprising, in combination, a primary incandescent lamp; a comparison incandescent lamp; said lamps having such characteristics that their light intensity is logarithmically related to the electrical energy supplied; a light responsive means; mechanism effective alternately to direct upon said means light from said primary lamp through a sample whose density is to be measured and light directly from said comparison lamp; variable impedance means in series circuit relation with a source of potential and said comparison lamp; indicating means, having a substantially uniform density scale, operatively connected to said impedance means; means, having a pair of input terminals, operative to vary the impedance of said impedance means as a function of the relative potentials of said input terminals; and switching means operable in synchronism with said mechanism to connect said input terminals alternately to the output of said light responsive means to control said variable impedance means to vary the potential applied to said comparison lamp to balance the light incident upon said light responsive means from both of said lamps.

DYED FILM EMULSIONS AID IN PRODUCING STEPPED MULTIPLE POSITIVES AND NEGATIVES. Otis W. Muckenfuss. *Modern Lithography* 20, No. 5, May, 1952, Pages 37 and 137 (2 pages). The making of multiple image glass print and photolacs on step and repeat machines is discussed. The author outlines a method using dyed film to overcome some of the problems inherent in these processes.

PROCESSING

PHOTO FILM BASE CHANGING. *Science News Letter* 60, No. 26, Page 405, December 29, 1951. A new film base produced by Du Pont's photographic film factory at Parlin, New Jersey, which is a polyester resin related to Dacron, is being given field trials. It is claimed that the polyester film is equal to nitrate in transparency and more dimensionally stable.

* PHOTOSENSITIVE LEUCOCYANIDE COMPOSITION. *U. S. Patent 2,528,496.* Lyman Chalkley. *Official Gazette* 640, No. 1, November 7, 1950, Page

83. 1. Photosensitive material comprising a leucocyanide of a triarylmethane dye dissolved in at least one carboxylic acid which transmits radiation of wave length within the range of about 2100 angstrom units to about 3800 angstrom units, said leucocyanide when irradiated with ultra-violet light within said range and in the presence of said acid producing color which does not fade in the dark.

* PHOTOGRAPHIC WETTING AGENTS. *American Specification*, Z38.8.14-1950. The performance of wetting agents for use in the processing of photographic materials (exclusive of colour photographic material) to assist the processing solution to act uniformly over the surfaces, and after washing and treatment in aqueous solutions, to facilitate uniform draining, is defined. *Photographic Abstracts* 3, 1951, Page 145. The Royal Photographic Society, 16, Prince's Gate, London, S. W. 7, England.

THE ACTION OF DEVELOPERS AS TANNING AGENTS. R. B. Pontius. *Photographic Society of America Journal*, Section B, Volume 17, No. 9, September, 1951, Pages 76-79 (4 pages). It is possible roughly to classify photographic developing agents according to their tanning action as strong, weak, and nontanning developers. Certain binary combinations of two developers may be made to yield a more vigorous tanning action than either developer alone under comparable conditions. The substances which can give tanning development when combined with a strong silver developer but weak tanning developer include tannic acid, gallic acid, and phloroglucinol, which are not in themselves silver developers under the same conditions. The action of pyrogallol can be improved by combination with other developing agents of high reduction potential. The tanning action of pyrogallol can also be reduced by combination with weaker developing agents such as Glycin or P-phenylenediamine. An explanation of this effect based on the reduction potentials of the developers is proposed.

* A METHOD OF IMPREGNATING GELATIN WITH A PHENOL FORMALDEHYDE RESIN. M. P. Blaber. *Chemistry and Industry*, 1951, Page 759. Dry gelatin relief images on photographic material are soaked for 10-30 min. in a soln. prepd. by adding 40 g. NaOH in 620 cc. H_2O to a mixt. of 1000 g. PhOH and 1875 cc. of 40% formalin, heating 3 hrs. at 65°, neutralizing with lactic acid, and removing H_2O by distn. The swollen gelatin is then heated 1-2 hrs. at 80° to give a deep hard relief image. *Chemical Abstracts* 46, No. 1, January 10, 1952, Column 47. *Chemistry and Industry* is published by Soc. of Chemical Industry, 56 Victoria Street, London S. W. 1, England.

APPLICATION OF ION EXCHANGE RESINS IN PHOTOGRAPHIC PROCESSING. H. P. Gregor. *Photographic Engineering* 2, No. 3, 1951, Pages 102-109 (8 pages). The chemistry of ion exchange processes used for the decontamination of photographic wash water and rejuvenation of exhausted hypo solutions is discussed in detail. The general characteristics of cation and anion exchange resins are described.

TONE REPRODUCTION

* DIRECT POSITIVES BY TRANSFER OF DIFFERENTIALLY-HARDENED LAYERS. *British Patent 655,274.* H. C. Yutzy and E. C. Yackel. *Photographic Abstracts* 31, Part 4, 1951, Page 227. An unhardened gelatino-silver halide emulsion coated on paper, film, etc., is exposed to an original and developed in a tanning developer to harden the layer differentially. A thin stratum of the unexposed and unhardened parts of the emulsion layer is transferred by squeegeeing while moist to a second support such as paper, cloth, etc., the amount transferred being dependent on the pressure of squeegeeing, temperature, dryness of the receiving surface, gelatin softness, etc. A direct positive print is thus obtained. The emulsion layer may contain insoluble pigments or

coupler components, and the optical density of the transferred image may be increased by treatment with sulphide, by re-exposure and development, or by coupler development. Preferentially the developing agent should be present in the emulsion layer, and development achieved by immersing the paper in a dilute alkaline solution. Additional transfer (up to 6-8 copies) may be made by re-wetting the differentially hardened emulsion layer with the alkaline solution and squeegeeing again. The image thus obtained is non-smudging. Advantages claimed for the process comprise the wide range of speed, contrast and density consequent on the use of gelatino-silver halide emulsions, better keeping properties, the possibility of securing increases in speed by means of development, the possibility of making clean transfers of part or whole of the unhardened photographic image, and elimination of washing steps. British patents can be secured from the Patent Office, 25, Southampton Buildings, London, W.C. 2, England, for approx. 36 cents.

* PHOTOGRAPHIC REPRODUCTION BY TRANSFER OF A STRATUM OF EMULSION LAYER. *British Patent 655,275.* E. C. Yackel. *Photographic Abstracts* 31, Part 4, 1951, Page 227. A method of photographic reproduction is described avoiding lateral reversal and differing from British Patent 655,274, in that a continuous stratum of emulsion is transferred to a receiving support, whereas in the former patent only the unhardened image areas of a differentially hardened emulsion layer are transferred. As an example, an unhardened gelatino-silver halide emulsion is exposed behind a negative, developed in an ordinary metol-quinol developer, fixed in a nonhardening bath and washed. The moist emulsion layer may be treated with a gelatin softening agent, e.g., urea, and is then rolled down on to a suitable receiving support. After a short interval, the receiving support is stripped away, bearing a thin continuous layer of the emulsion with it. To make successive prints, the residual emulsion layer is remoistened with the softening agent before transferring. The process may be repeated up to 10-12 times consecutively or, if desired, the residual emulsion layer may be dried off for storage, and then be re-softened before use. Alternatively, the softening agent may be added to the developer, and transfers of moderate stability made without further treatment. The invention covers the use of colloidal binders other than gelatin and means other than exposure of a silver salt and subsequent processing can be used, e.g., coloured images formed in the layers by imbibition may be transferred.

THE ALUPHOTO PLATE AND PROCESS. Eugene Wainer. *Photographic Engineering* 2, No. 3, 1951, Pages 161-169 (9 pages). Aluphoto is a recently developed Swiss invention which provides a method for making photographic reproductions on an aluminum base, such reproductions exhibiting a number of unusual properties and advantages for a large number of applications. Basically, the Aluphoto plate is a photosensitive anodized aluminum sheet on which the photographic image is developed in the anodized layer. After sensitization and exposure in the standard darkroom printer, the image is then developed in a manner exactly comparable to that used for ordinary silver halide gelatine emulsion type pictures—that is, using standard developing and fixing chemicals. Outside of the unusual structural and physical properties, the finished Aluphoto plate exhibits important properties from a photographic point of view such as the substantially grainless image, the high degree of resolution which can be expected, and the continuous tone.

* PHOTOGRAPHS ON ALUMINUM. Eugene Wainer. *Iron Age* 168, 25, Pages 104-5 (1951). The Aluphoto plate in a recently developed Swiss method is a photosensitive anodized Al sheet on which the photographic image is developed in the anodized layer. After sensitization and exposure with the standard

darkroom printer, the image is developed by using standard developing and fixing chemicals. The finished plate offers a substantially grainless image, a high degree of resolution, and continuous tone. The plates are not affected by nuclear radiations. The process is based on the deposition of a Ag compound in the pores of a fibrous Al compound which is formed on the metal surface by electrolysis or chemical treatments. The plate containing photosensitive material in the unsensitized condition can be stocked for years. In the sensitized condition the plates are stable for 2 to 3 months. The plate is permanently stable after the image is formed. Once sensitized, exposed, and developed, the plate surface can be heat-sealed and becomes hard and glasslike. The surface can be wheel buffed to a high gloss. The anodized layer has an average thickness of 0.01 to 0.015 mm. Properly prepared, the photographic surface is highly resistant to scratching, weather, salt, air, salt-water corrosion, and is unaffected by contact with cold or hot foodstuffs, organic oils and solvents, and organic acids. *Chemical Abstracts* 46, 5, March 10, 1952, Column 1895. *Iron Age* is published by Chilton Company, Inc., 100 E. 42nd Street, New York 17, N. Y.

* PHOTOGRAPHIC DIRECT POSITIVE MATRIX PROCESS. *U. S. Patent 2,566,234.* Anthony Marriage. *Official Gazette* 649, No. 4, August 28, 1951, Page 1188. 1. A Method of producing a photographic relief image comprising the steps of exposing to an image-forming light a photographic element comprising a layer of an unhardened sensitive silver salt emulsion a test portion of which upon exposure to a light intensity scale for a fixed time between 1/100 and 1 second and development for 3 minutes at 20° C. in the following internal type developer (II):

Hydroquinone	grams	15
Monomethyl para-aminophenol sulfate	"	15
Anhydrous sodium sulfate	"	50
Potassium bromide	"	10
Sodium hydroxide	grams	25
Sodium thiosulfate	"	20
Water to	liter	1

gives a maximum density at least 5 times the maximum density obtained when the equally exposed silver halide emulsion is developed for 4 minutes at 20° C. in the following surface developer (I):

Para-hydroxyphenyl glycine	grams	10
Sodium carbonate	"	100
Water to	liter	1

treating the emulsion to render it capable of forming latent image developable by the aforesaid developer (I), without appreciably developing the first-formed latent image to a visible image, subsequently uniformly exposing the emulsion layer through the support to radiation to which the emulsion is sensitive and the penetration of which through the emulsion is restricted to a greater extent than said imageforming light, developing the surface latent image formed by the said radiation, tanning the layer where silver is thereby produced and removing the untanned colloid of the layer.

DETAILS OF NEW RECORDING DENSITOMETER. George W. Jorgensen. *Modern Lithography* 19, No. 12, December, 1951, Pages 38-40 (3 pages). The Lithographic Technical Foundation announces details of its new recording densitometer. The recording densitometer was designed to study the tone reproduction characteristics of the lithographic process in order to improve quality, consistency, and control. The initial study will be in two parts: (1) the objective phase to determine the influence of the different variables on tone reproduction and (2) the subjective phase to determine the relationship of various tone reproduction curves to the "quality" or appearance of the printing.

THE PSYCHOPHYSICAL EVALUATION OF THE QUALITY OF PHOTOGRAPHIC REPRODUCTIONS. Lloyd A. Jones. *Photographic Society of America Journal* 17, No. 12, December, 1951, Pages 751-64 (14 pages). This article is based on the PSA Progress

Medal Lecture given by the author in October, 1950. In it, stress is given to those methods that are characterized as psychophysical as distinguished from purely physical or objective methods. Discussed are: luminance distribution in exterior scenes, positive materials, psychophysics and psychophysical relationships, dependence of photographic quality on negative exposure, correlation between negative density scale and exposure scale of positive materials, and tone reproduction in first-choice prints.

MEASURING THE IMAGE TONE OF PHOTOGRAPHIC PAPER. Walter H. Carnahan. *Photographic Society of America Journal* 18, Section B, No. 1, March, 1952, Pages 7-10 (4 pages). A numerical method for expressing the image tone of photographic paper is described. Spectrophotometric measurements of reflectance at three wavelengths expressed in percent define the color of the image. Image tone is most noticeable at medium densities which give data indicative of the tone of the whole range of densities.

* *Ger. Patent Application I. 76,000.* I. G. Farbenindustrie A.-G. For emphasizing or for reproducing exclusively the black portions of a colored original and especially for the production of a black printing plate for photomechanical reproduction in color, an exposure to the original is made with infrared radiation alone, according to the invention. All visible rays are eliminated by means of a black filter. See also U. S. Pat. 2,161,378, filed June 6, 1939, by A. Murray. *Monthly Abstract Bulletin* 37, No. 10, October, 1951, Page 547. Photostats of foreign patents may be obtained from the Commissioner of Patents, Washington 25, D. C.

HALFTONE PHOTOGRAPHY

* PHOTO - MECHANICAL PRINTING SURFACES. *British Patent 618,113.* Crowell-Collier Publishing Company. *Abridgement of Specifications* Group XX, Page 273. A screened positive transparency which has discrete silver dots of varying sizes, formed as by use of a reduced screen distance and exposure time, is subjected to the action of a bleaching medium to completely or partially bleach the dots and is then redeveloped in a colour developer to impart colour to the bleached dots or bleached portions of the dots, and such is used for preparation of an intaglio printing surface by known photographic and etching methods. The screened positive may be made from an ordinary photographic negative of a subject, or from a separation negative of one of the colours of a coloured subject; and is bleached as by use of a potassium bromide-potassium ferricyanide solution for a time sufficient to permit only the peripheries of the larger dots to be bleached; redeveloped as by a solution containing ρ-aminodiethylaniline monohydrochloride as colour developer and ρ-nitrophenylacetonitrile as colour coupler which produces magenta in the bleached areas; and cleared as by Farmer's Reducer for a time insufficient to reduce the size and opacity of the centres of the larger dots; all of these operations being carried out under observation in bright light and requiring times of treatment such as 20 to 100 seconds. In the drawing, Fig. 1 represents the subject, Fig. 2 a screened positive transparency of such, Fig. 3 this positive as modified by the invention and indicating coloured areas of dots by hatched lines; and Figs. 4 and 5 plan and section views respectively of an intaglio printing surface produced from the modified positive of Fig. 3. British Patent Office, 25 Southampton Buildings, London, W. C. 2, England.

* PHOTO-MECHANICAL HALFTONE SCREENS. *British Patent 628,872.* Kodak Ltd. *Abridgement of Specifications* Group XX, Page 136. Relates to a method of manufacturing contact halftone screens such as are described in Specification 544,033, in which a photosensitive layer is processed after exposure to a light source at an effectively infinite distance therefrom, through a master screen having rectilinearly disposed transparent and opaque elements. In a known method, the distance be-

tween the master screen and the photo-sensitive surface is given by $\frac{1}{12N^2\lambda}$ where N is the number of lines per unit length of the screen, and λ the predominant wavelength of the exposure light. This screen distance is inconveniently short for screens of over 200 lines per inch, and in the method described is made $\frac{1}{N^2\lambda} \pm 10\%$. This distance must be calculated as if the master screen were a simple lens forming an image of the light source on the photo-sensitive surface if the distance of the light source is not effectively infinite. It is found that, owing to the diffraction effects, the size and shape of the master screen openings are unimportant; the master screen may therefore be either a standard crossline screen or one produced photographically. Light from a lamp and reflector is passed through a filter and a diffusing screen to illuminate an aperture which acts as a source of light for the exposure. To illuminate the aperture more evenly, the lamp may be replaced by four lamps, or the reflector may comprise four plane mirrors and/or the diffusing screen may be replaced by a lens. British patents may be secured from the Patent Office, 25 Southampton Bldgs, London, W. C. 2, England, for approximately 36 cents.

CONTACT MAGENTA SCREENS: A NEW METHOD IN OFFSET POSITIVES. P. Kowaliski and J. Vareine. *Le Procede* 48, January-February, 1952, Pages 1-8 (Translation of the French by H. M. Cartwright). The authors describe a method of improving the rendering of shadows and highlights when using the magenta contact screen for making halftone positives. The method is as follows: An under-exposed continuous-tone negative mask is first made of the original on process film. This mask is then registered on a screen negative made by the contact screen on process film. The combination of the mask and screen negative is then contact printed onto process film by exposing 2 to 3 times as long as without the mask. *Process Engravers Monthly* 59, 700, April, 1952, Pages 115-6.

PROCESS WORK BY INFRA-RED: A NEW APPLICATION. F. G. Wallis. *Process Engravers Monthly* 59, 700, April, 1952, Pages 110 and 115 (2 pages). The author describes some experiments using infra-red plates for making halftones from black and white originals. First, a normal halftone exposure is made through the screen, then the screen is replaced with a compensating glass and a continuous tone exposure is given through an infra-red filter (No. 88). The continuous tone exposure gives additional exposure to the whites while the blacks would not record.

THE THEORY OF THE HALFTONE SCREEN: A STUDY IN DIFFRACTION. V. G. W. Harrison. *Photographic Journal* 92B, May-June, 1952, Pages 74-91 (16 pages). A new theory of the formation of screen negatives with the common types of cross-line screen is developed and confirmed experimentally. Recommendations for the use of the screen are given and explained theoretically. The gradation of all screen negatives obtained through cross-line screens is shown to be faulty and it is not possible to produce a perfect negative by a manipulation of screen distances, stop sizes, etc. Any substantial improvement in tone rendering can be expected to come through the use of contact screens.

COLOR — GENERAL

* THE COLOUR TEMPERATURE OF LIGHT SOURCES. H. G. W. Harding. *Proc. Phys. Soc. B*, 1950, 63, Pages 685-698. The new definition of colour temperature is explained and the difficulties of making the measurements dealt with. The spectral transmission curve of colour temperature conversion filters is calculated, and the use of these filters (particularly the Chance O.B.9) for extending the range of standard lamps is discussed. *Photographic Abstracts* 3, 1951, Page 139. The Royal Photographic Society of Great Britain, 16 Princes Gate, London S. W. 7, England.

* COLOR TEMPERATURE METER. *U. S. Patent 2,579,347*. Clement F. Tay-

lor. *Official Gazette* 653, No. 3, December 18, 1951, Page 832. 1. A color temperature meter comprising a pair of similar photovoltaic cells, light intercepting means in the path of light to said cells including a red filter and a blue filter in parallel light intercepting relation, a portion of said light intercepting means being adjustable to vary the relative magnitude of the filtered light of one of said colors reaching one cell as compared to the magnitude of the filtered light of the other of said colors reaching the other cell, an electrical instrument having a two-pole permanent magnet pivotally mounted and freely rotatable armature, the adjustable portion of said light intercepting means being movable directly by and with said armature, and a stationary field winding for said instrument connected directly to said cells, so as to be energized in response to the differential output of said cells, and which when energized determines the rotary movement of said armature, the rotation of said armature in response to such differential cell output being in a direction to equalize the output of said cells.

GAY WORLD ALL GRAY TO SOME. Martha G. Morrow. *Science News Letter* 60, No. 9, Pages 138-9 (2 pages). Recently scientists have been designing new color vision tests and improving old ones. Several of these tests and some of the basic research that will make future tests easier to design and more reliable in performance are described.

* PHYSICALLY ENLARGING A PHOTOGRAPHIC COLOR TRANSPARENCY. *U. S. Patent 2,575,970.* William J. Nagel. *Chemical Abstracts* 46, 5, March 10, 1952, Column 1903. A multicolor layered transparency having a cellulose ester base and an anticurl gelatin backing soaked in a 5% NH_3 solution for 10 minutes, and the backing is scraped off. The transparency is then sandwiched between a ferrotype board and a temporary support coated with a low-temperature dissolving gelatin and Na salts (preferably 5% NaF and 5% Na_2CO_3) with the cellulose ester base next to the ferrotype board. After the unit has been released from the ferrotype board, it is soaked in a solvent to soften the cellulose ester base which is then removed. The transparency is placed into water at 120° F. which dissolves the gelatin and releases the Na salts which then cause the enlargement of the transparency. The enlarged transparency is then mounted on a support.

COLOR FILM ANALYSIS FROM INTEGRAL DENSITY DATA. Monroe H. Sweet. *Journal of the Optical Society of America.* 42, 4, April, 1952, Pages 232-7 (6 pages). By using the relationship between the spectral densities of specimens of a given kind of color film at three separated wavelengths and their chromaticities, integral color densitometer data can be correlated with dominant wavelength and purity data. Transformation grids are prepared to facilitate this conversion. Color film balance can be represented by a series of vectors, each drawn from different density levels along a density *vs.* log exposure curve. The vectors represent, by their directions, the dominant wavelengths of the corresponding gray-exposed patches of the sensitometric strip and by their lengths, the extent of the departure from gray balance. For any particular case, a grid can be prepared which relates the vectors to the corresponding Munsell colors of the patches. In a similar way, the correlation between the vectors and the filtration of the light source necessary to correctly reproduce gray can be established and utilized in grid form. Although developed primarily for three-layer reversible color film, the treatment is applicable to any three-color reproduction process.

A NEW APPROACH TO THE PHOTOGRAPHIC PROBLEMS OF COLOUR PHOTO-LITHO. D. C. Gresham. *Photographic Journal* 92B, May-June, 1952, Pages 91-102 (12 pages). The photo-litho process, using a cross-line screen, normally gives poor tone reproduction unless a considerable amount of hand work

is introduced at some stage. In colour reproduction work, the well-known errors due to unwanted spectral absorptions of the printing inks are superimposed upon those caused by the poor tone reproduction characteristics. A process has been developed by which screen positives are made directly from monochrome or coloured originals. A screen negative exposure is made in the ordinary way; the negative is developed in a colour developer and the silver image is bleached without removing the silver halide from the originally unexposed areas. The plate is replaced in the camera without the screen and given a second, positive forming, exposure partly to the original and partly to white paper. The positive image is developed to silver in a high contrast developer and the plate is fixed to leave a silver screen positive and a dye screen negative in the complementary areas. Finally, the dye image is removed and the remaining screen positive has tone reproduction characteristics which match theoretical requirements very closely. In colour reproduction, the screen negative exposures are made through the usual colour filters but the positive-forming exposures are made in the camera to the original through filters of different colours from the negative exposures. This results in simultaneous tone and colour correction. The theory and practice of this process are discussed.

COLOR — SEPARATION AND CORRECTION

* BRIGHTNESS CORRECTION MASK FOR COLOUR PHOTOGRAPHY. *U. S. Patent 2,533,452.* P. K. Glasoe and D. Dean. *Printing Abstracts* 31, No. 122, Part 2, 1951, Page 135. This separable mask is used in the preparation of coloured copies to give brightness correction to one or more of the images for one of several possible reasons. In one example, it is stated that due to a processing defect, the contrast of the cyan dye layer is frequently steeper when it is being developed in a region where no development is occurring in the magenta layer, i.e., in a red or magenta image area, compared with a region in which development is occurring in the magenta layer, i.e., a neutral or blue image area. This results in an undesirable increasing contrast of red and magenta coloured objects which is increased on copying on a material showing the same defect. According to the invention, a panchromatic emulsion layer is laminated base down upon the original transparency. The combined material is exposed to green light through the transparency and developed to silver. It is then exposed to red light through the transparency and cyan colour developed. Silver and silver halide are then removed to leave a weak cyan image of opposite contrast to the main cyan image and only present in regions where the magenta dye is present in the transparency.

* *U. S. PATENT 2,507,494.* J. A. Ball. *Printing Equipment Engineer* 80, No. 4, July, 1950, Page 62. The process of multicolor reproduction described is of general application in the photographic and graphic arts, including continuous-tone and halftone dot structure processes and also photogravure processes of printing multicolor pictures. The process comprises exposing four light-sensitive photographic layers to produce four color-separation negatives through light filters which will produce response peaks in the ranges, 445 to 455 millimicrons, 605 to 630 millimicrons, 490 to 535 millimicrons, and 545 to 575 millimicrons. The latent images so produced are developed, and four printing plates with positive images are made. Separate successive imprintations are made in register on sheet material from ink-containing colorants, which may be dyes or pigments. *Monthly Abstract Bulletin* 37, No. 9, September, 1951, Page 458.

THE BELIN ELECTRONIC SCANNING MACHINE. L. P. Clerc. *Process Engravers Monthly* 58, No. 693, September, 1951, Pages 266 and 269 (2 pages), translated from *Le Procede* 47, May-June, 1951, Pages 33-36 (in

French) by H. M. Cartwright. The Belin Electronic Scanning Machine of the Etablissements Edouard Belin, France, is designed to effect automatic selection and screening for polychrome printing on fabrics. The separation of colors for fabric printing is different from trichrome separation used in the photo-engraving process in that the screens, of considerably coarser pitch, must separate each hue, i.e., a purple red, a vermilion, and an orange red, have to be reproduced with separate printing cylinders. The reasons for this are the penetration of the dyes into the fabric, and the fabric printer wants to use them for the production of variations. In scanning, the original is stretched around a cylinder where it is explored, point by point, and by suitable optical and electronic means forms opaque dots or lines on sensitized film.

REVIEWS MOST RECENT ELECTRONIC SCANNER PROGRESS. Frank Preucil. *National Lithographer* 58, No. 9, September, 1951, Pages 34-35, 108 and 110 (4 pages). The author reviews the recent and proposed improvements in electronic scanners. The new R.C.A. system is based on Interchemical correction circuits but employing flying spot scanning. The Time-Life scanner can now scan 1000 lines per inch and applies the principles of unsharp masking with optics and electronics to improve sharpness of detail. Also discussed are the recent patents of J. A. Ball which claim the advantage of wider color gamut in printing by employing 4 and 5 colors (not including black).

MASKING TECHNIQUES. Henry R. Long. *National Lithographer* 58, No. 9, September, 1951, Pages 60-61 and 107 (3 pages). This is the first part of two articles on masking technique. Discussed in this part are: (1) Photographic overlays, and (2) Overlays made from positive-negative combinations.

THE DIRECT FOTOCOLOR PROCESS. Jeffery White. *National Lithographer* 58, No. 9, September, 1951, Page 50. This article discusses the advantages of preparing separation negatives directly from the original subject rather than from color prints such as carbros and dye-transfers, or from color films. It is suggested that many plants experienced in producing black and white could easily enter the color printing field by using a reliable color separation service and preparing their own halftones and plates.

MASKING TECHNIQUES. Henry R. Long. *National Lithographer* 58, No. 10, October, 1951, Pages 42-43 and 86 (3 pages). This is the second and concluding article on the various masking techniques in current use. Discussed are: (3) Image overlays, (4) Modulated light masking, (5) Multiple emulsions, and (6) Electronic masking.

• METHOD FOR CORRECTING PHOTOGRAPHIC COLOR PRINTS. *U. S. Patent 2,571,697.* Ralph M. Evans. *Official Gazette* 651, No. 3, October 16, 1951, Page 857. 1. The method of printing a multi-color transparency onto a photographic printing material whose sensitivity lies in three different regions of the spectrum, which comprises uniformly illuminating said transparency with light which contains energy in said three regions of the spectrum, integrating the light transmitted through the transparency, measuring the color of said integrated light, determining the color and amount by which said integrated light departs from light which will print as gray on said printing material, adjusting the intensity of the printing light so that when integrally passed through said transparency, it has the same printing characteristics as light which prints substantially as gray, and then focussing and printing said printing material with said last-mentioned light.

• PHOTOGRAPHIC MASKING PROCESS. *U. S. Patent 2,561,698.* Scheuring S. Fierke. *Official Gazette* 651, No. 3, October 16, 1951, Pages 857-8. 1. The method of forming a masking image in a

multilayer color film having three superimposed silver halide emulsion layers sensitized respectively to the red, green and blue regions of the visible spectrum and containing coupler compounds for color-developing in said emulsion layers dye images of colors complementary to the sensitives of said emulsion layers, the principal halide constituent of said layers being a halide other than silver iodide, the blue-sensitive layer being outermost, and a silver iodide emulsion layer between any two of said emulsion layers, which comprises exposing said film to a colored subject, developing silver and subtractively colored dye images in said red, green and blue-sensitive emulsion layers by means of a primary aromatic amino developing agent, removing said silver images and residual silver halide from said three emulsion layers, exposing said masking emulsion layer through a dye image other than the yellow dye image in said film, developing a masking image in said exposed masking emulsion layer and removing the residual silver halide from said film.

* COMPUTING DEVICE FOR PHOTOGRAPHIC COLOR PRINTING PROCESSES OF MASKING TYPE. *U. S. Patent 2,573,113.* Alfred Simmon. *Official Gazette* 651, No. 5, October 30, 1951, Page 1410. 1. A computing device for photographic three color printing processes of the masking type comprising: a scanning unit, adapted to receive a test object and three separation negatives made therefrom, and including a moving pencil of light and a photoelectric cell with its supply circuit; a photo-cell current-density converter, adapted to convert currents passing said photocell into voltages proportional to photographic densities; a recording device, adapted to record said voltages proportional to densities; means to play back simultaneously the voltages representing densities of said test object and of said three separation negatives, respectively; means to coordinate said played back voltages whereby the voltages played back at any given time denote densities of the same point upon the test object and the three separation negatives, respectively; at least one negative-positive converter adapted to convert voltages representing densities of a photographic negative into voltages representing densities of a positive print made from said negative upon sensitized material of known characteristics under assumed exposure time and contrast conditions, including means under the control of the operator to adjust said last-named two conditions; a masking network, additively combining at least one voltage representing densities of one of the separation negatives with a voltage representing densities of at least one positive printed, respectively, from one of the two other separation negatives, said last-named voltages having been produced by negative-positive converters as described above, whereby at least one voltage is generated representing densities of a masked separation negative; and an indicating device showing the densities of said masked separation negative as a function of the corresponding densities of said test object.

THE MULTICHROM MASKING CAMERA. Henry R. Long. *National Lithographer* 58, No. 12, December, 1951, Pages 32-33 (2 pages). The author describes the design and applications of the Multichrom camera. The camera, made in England, is suited for use in various methods of tone and color corrections.

REVOLUTIONARY THOUGHTS ON COLOUR REPRODUCTION. R. B. Fishenden. *Modern Lithographer and Offset Printer* 47, No. 12, December, 1951, Pages 237-8 (2 pages). The author discusses the recent patents of J. A. Ball on four and five color printing. While our present three color system meets the practical commercial needs, the advantages in the rendering of violets, purples, and greens by the five color process shows the need for a new scientific approach in color reproduction, the need of an automatic or semi-automatic system for

the reproduction of colors which cannot be reproduced correctly in a system based on yellow, cyan, and magenta pigments now available.

* COLOR CORRECTION PROCESS. *U. S. Patent 2,578,333.* J. A. C. Yule. *Chemical Abstracts* 46, No. 8, April 25, 1952, Column 3434. Automatically color-corrected reproductions are made by a process in which the dye images of an original film compensate for the dry images in the final print. This is accomplished by processing one or more emulsions of a multilayer color negative to subtractively negative images, reversing the remaining emulsions, and forming subtractively colored positive images therein. The negative images act as masks for the positive images and thereby compensate for the deficiencies of the dye images in the subsequent reproduction.

* PHOTOGRAPHIC COLOR CORRECTION. *U. S. Patent 2,595,768.* Ronald B. Collins, Douglas J. Fry, and Oliver E. Pratt. *Official Gazette* 658, No. 1, May 6, 1952, Pages 211-12. 1. A process for the production of a colour-corrected photographic record which comprises subjecting a photographic material which contains in at least one layer; a substantive colour-former which has in the position at which the said colour-former couples on colour development and acid grouping selected from carboxylic and sulphonic acid groups and also contains a record dye image obtained by such coupling development, the said dye image undesirably absorbing to some extent light of wavelengths which it is desired that it should transmit, to treatment with a basic dye, thereby forming with the residual colour-former in the said layer an image of opposite sign to the said record dye image, the said image of opposite sign being in a complex of such residual colour-former and said basic dye, the hue and intensity of such image of opposite sign being such that it absorbs light of at least some of the wavelengths which the record dye image undesirably absorbs, so that the absorption of such wavelengths is substantially uniform over the whole layer, and transmits more freely than the record dye image in the remaining wavelengths.

* METHODS FOR MAKING MASKS FOR PHOTOGRAPHIC TRANSPARENCIES. *U. S. Patent 2,596,677.* John W. Gosling and Charles S. Combs. *Official Gazette* 658, No. 2, May 13, 1952, Page 529. 1. The method of making a masked photographic transparency which comprises marginally sealing a photographic transparency between a transparent sheet and a photographic element carrying a light-sensitive emulsion layer on a transparent support, with said sensitive layer outermost, without separating said elements exposing said emulsion layer through said transparency and developing a masking image in said exposed layer.

AN APPARATUS FOR MASKING 35 mm. TRANSPARENCIES. R. Donald Reed, J. M. DeBroske and H. J. Cole. *Modern Lithography* 20, No. 5, May, 1952, Pages 47-9 (3 pages). The authors believe that the 35 mm. color transparency is excellent in technical quality, but leads to difficulty in reproduction because of the registration problem when masks are used. To solve this, they have developed an accurate device to facilitate registration that is discussed in some detail.

PLATEMAKING — GENERAL

OFFSET PLATES IN THE PRESSROOM. Charles W. Latham. *American Printer* 132, No. 10, October, 1951, Pages 44-45, 60, 62, and 65 (5 pages). The author explains the procedures for handling offset plates in the pressroom. The importance and preservation of grain and the differences between printing and non-printing areas are discussed along with recommended procedures for cleaning the plate if it catches up, for clamping and tightening the plate, and for the use of cylinder marks.

LTF RESEARCH GROUP REPORTS ON PLATE TROUBLES. Charles F. King. *Inland Printer* 128, No. 4, January, 1952, Pages 49-50 (2 pages). A summary of the annual meeting of LTF Research Committee in Chicago, December 3 and 4, 1951. Among the developments described at this meeting were: a new method of determining the ability of a lithographic image to resist blinding, a new lacquer which did well under this test, a method for chemically depositing copper on drums and riders in the inking system, an aluminum copper bi-metal plate, radioactive tracer studies, a recording densitometer, piling of paper coatings on blankets, paper dampener covers, a new press wash-up using three solutions, a device for measuring the pick resistance of paper, and adaptation of the principle of the Inkometer to the measurement of tack on the press, and the use of diazo sensitizers in platemaking.

BETTER CONTROL MEANS BETTER LITHOGRAPHY. Charles W. Latham. *American Printer* 133, 3, March, 1952, Pages 42-3, 56 & 58 (4 pages). Mr. Latham discusses control of: 1. Thickness of plate coating 2. Uniformity of exposures 3. Importance of magnifiers 4. Paper humidity factors 5. First color register 6. Thickness of packing, etc. 7. Fountain solutions 8. Acid in platemaking 9. Exact control of tones.

* COLOR PRINTING PLATES. *U. S. Patent 2,577,984.* Harry W. Warnecke. *Chemical Abstracts* 46, No. 8, April 25, 1952, Columns 3436-8. Colored, screened, positive color-sepn. (monochromatic) transparencies are detachably mounted on an opaque white support to provide a color proof. If the proof is satisfactory, a black-and-white, screened negative is made from the transparencies and is used in making plates. The advantage of the method lies in the reduced time required to det. whether a satisfactory colored print will be produced.

PLATEMAKING — EQUIPMENT AND METHODS

* PHOTOLITHOGRAPHIC PLATE INKING, DRYING, AND DEVELOPING MACHINE. *U. S. Patent 2,555,874.* Harry A. Coughlin. *Official Gazette* 647, No. 1, June 5, 1951, Page 234. Means for moving the plate through the machine and effecting different operations on the plate are claimed.

* METHOD AND APPARATUS FOR COATING A LITHOGRAPHIC PLATE. *U. S. Patent 2,580,131.* George S. Rowell. *Official Gazette* 653, No. 4, December 25, 1951, Pages 1124-5. 5. The method of coating a lithographic plate to form a coating of substantially uniform thickness which comprises rapidly revolving said plate in a horizontal plane about an axis generally centrally thereof, pouring a coating liquid centrally on said revolving plate whereby said liquid will be spread under influence of centrifugal force, causing a current of air to flow uniformly radially inwardly over such revolving plate from about the entire periphery of the latter during application of said liquid to dry said liquid, and removing said air from the center surface of said plate upwardly along the axis of rotation.

* INKING MECHANISM FOR ROTARY LITHOGRAPHIC PRESSES. *U. S. Patent 2,588,470.* Ellis Bassist. *Official Gazette* 656, No. 2, March 11, 1952, Pages 369-70. 1. In a lithographic printing machine having a rotating cylinder for mounting a lithographic printing plate on the peripheral surface thereof, an inking roller mounted for rotational movement in surface contact with the

cylinder for mounting the printing plate for applying ink thereonto, a first ink reservoir roller mounted for rotational movement in surface contact with the ink applying roller but out of contact with the cylinder for mounting the printing plate, a second ink reservoir roller mounted for rotational movement in surface contact with said first ink reservoir roller but out of contact with said ink applying roller and for reciprocation axially relative thereto during rotational movement, said ink reservoir rollers being formed of porous material having a permeability to water greater than that to ink for removing excess water from the ink applying roller and absorbing same into the interior thereof while ink for transferring to the ink applying roller locates in the outer portions thereof.

PLATEMAKING — MATERIALS AND METHODS

A PROCESS FOR MAKING ACID RESISTS FOR GRATICULES. E. E. Loening. *Process Engravers Monthly* 57, 1950, Pages 266, 269-70, 297-8, and 301 (6 pages). A process is described for the manufacture of acid-resisting stencils on metal, glass, or other supports on a commercial scale. The process is particularly suitable for the production of etched graticules on glass owing to the high definition and resistance of the stencils. The support is coated with a Bakelite resin layer and supercoated with dichromated gum. After exposure, the gum stencil is developed with lactic acid which, at the same time, removes the Bakelite from under the developed parts of the gum stencil. *Chemical Abstracts* 45, No. 16, August 25, 1951, Page 6945.

• PHOTO-MECHANICAL PROCESSES. *British Patent 618,181.* A. A. K. Whitehouse. *Abridgement of Specifications* Group XX, Page 274. Screens or stencils are made by coating or impregnating a foraminous sheet material with a mixture of an unsaturated linear polyester resin and polymerizable $CH_2 = C <$compound compatible therewith and a photo-sensitizer for the mixture, exposing the coated sheet to light through a negative of the required pattern to harden the mixture on the unscreened portions, and then treating the sheet with a solvent to remove unhardened mixture. Woven textile fabric is preferred as sheet material, particularly silk fabric. The unsaturated linear polyester resin may be made by condensing a dihydric alcohol such as ethylene glycol, di- or tri-ethylene glycol or propylene glycol with an unsaturated dibasic acid or anhydride such as maleic, citraconic or itaconic acids or anhydrides, or fumaric acid or their adducts with diolefines such as cyclopentadiene in approximately molar proportions; or by reacting an unsaturated dihydroxy alcohol with a saturated dibasic acid or anhydride, such as phthalic anhydride; or an unsaturated hydroxy acid may be caused to undergo a polycondensation reaction. The polymerizable $CH_2 = C <$compound may be styrene, vinyl esters or acrylic or methacrylic acids or esters. Quinol or other inhibitor is added to stabilize the mixture during preparation and storage; if the amount is small, it does not inhibit photopolymerization. Styrene has been found to be particularly suitable and commercial styrene already contains a stabilizer. The photo-sensitizer may be a ketone such as benzoin or benzophenone. Plasticizers such as tricresyl phosphate or dibutyl phthalate may be included in the sensitive mixture. Exposure may be effected by projection or by contact printing, and in the latter case a regenerated cellulose sheet may be placed between the coated sheet and the negative to prevent contamination of the latter with resin. Ultra-violet light hardens the resin mixture more rapidly than visible light. Acetone, diacetone alcohol or benzene may be used to remove the unchanged resin mixture, and after drying coated fabric so prepared is ready for use by the standard technique of silk screen printing. British Patent Office, 25 Southampton Buildings, London W. C. 2, England.

* PLANOGRAPHIC PRINTING PLATES. *British Patent 648,897.* Gevaert Photo-Producten N.V. *Photographic Abstracts* 3, 1951, Pages 181-182. A support carries a hydrophilic colloid layer which is treated to form ink-receptive areas with reducing agents and, after exposure, with salts capable of acting with more than one valency. In an example the stencil is formed on an unhardened silver halide emulsion layer by exposure through a negative, developing in a tanning developer such as pyrocatechol, washing away the unexposed parts in warm water, bathing in dilute citric acid, followed by a mixture of formaldehyde, pyrogallol and potassium ferrocyanide and finally with a gum arabic-cupric chloride solution. Alternatively the exposure may be through a positive, and the image reversed by developing in a non-tanning developer, followed by uniform exposure and development in a tanning developer. British Patent Office, 25 Southampton Buildings, London. W. C. 2, England.

* WATER REPELLENT INK TRANSFER SURFACE. *U. S. Patent 2,562,782.* Frederick H. Frost. *Official Gazette* 648, No. 5, July 31, 1951, Page 1518. 1. Lithographic printing process which comprises wetting different areas of the surface of a lithographic plate with ink and an immiscible aqueous liquid and contacting said surface with another surface which is ink-receptive and non-water-adsorbent.

* DEVELOPER FOR BICHROMATED COLLOIDS. Paul J. Whyzmuzis and William O. Kaupp. *U. S. Patent 2,564,411. Official Gazette* 649, No. 2, August 14, 1951, Page 539. 1. A developer for bichromated water soluble colloid coatings comprising a concentrated aqueous solution of calcium chloride and zinc chloride in a weight ratio between 3 to 2 and 1 to 1, and from 1 to 3% by weight of hydroxy-acetic acid.

* ADHESION OF ELECTRODEPOSITS MEASURED BY SIMPLE METHOD. *AMINCO Laboratory News* 8, No. 5, September, 1951, Page 1. A new simple, and inexpensive method for measuring the adhesion of most commercial electrodeposited coatings was developed at the National Bureau of Standards by Abner Brenner and Virginia Morgan. The method involves the electrodeposition of an adherent nodule on the surface of the coating to act as a grip for the application of a detaching force required to pull the nodule and a portion of the coating from the base metal. This force is measured in ordinary mechanical units by a spring balance. From the reading of the balance and measurement of the nodule's base area, the adhesive force per unit area is computed. The new method is said to overcome most of the difficulties encountered in older methods. Details are given in the Proceedings, American Electroplaters Society, 1950, Page 51.

* CELLULOSE ESTER LITHOGRAPHIC PRINTING PROCESS. *U. S. Patent 2,568,503.* William O. Kenyon and John A. Cathcart. *Official Gazette* 650, No. 3, September 18, 1951, Page 844. 1. The method of forming a design on a cellulosic surface for printing purposes, which comprises sensitizing a hydrolyzed surface layer of a cellulose organic acid ester sheet with a ferric salt reducible with light of the blue and ultra-violet regions of the spectrum but incapable of oxidation of hydrolyzed cellulose organic acid ester to the alkali removable state in the presence of said light, exposing said sensitive layer under a design thereby producing a ferrous salt image in the exposed areas, treating the exposed layer with an oxidizing agent oxidizing said hydrolyzed cellulose ester layer only in the region of said ferrous salt image and removing the oxidized material with an alkaline solution.

* METHOD OF CONTINOUSLY RENEWING LITHOGRAPHIC PRINTING SURFACES BY MEANS OF THE FOUNTAIN FLUID. *U. S. Patent 2,569,488.* Douglas A. Newman. *Official Gazette* 651, No. 1, October 2, 1951, Page 79. 1. The process of planographic printing

which comprises forming an ink-receptive water-repellent image on a planographic plate having its printing surface coated with a water-insoluble carboxymethyl cellulose compound, dampening said plate with an aqueous fluid comprising water and a colloidal thickener consisting essentially of a carboxymethyl cellulose compound dissolved therein in an amount yielding the desired viscosity, inking said plate to deposit ink on the image portions thereof, transferring the ink from said image to a copy sheet, and sucessively repeating said dampening inking and transfer operations.

* FERROGRAPHY. Ralph B. Atkinson and Steven G. Ellis. *J. Franklin Institute* 252, No. 5, November, 1951, Pages 373-81 (9 pages). Describes a new process which has been named "Ferrography". The process can be used to record graphic information on magnetic materials and to reproduce it on paper in visual form. Essentially, the method makes use of the magnetic-retentive properties of ferrous materials to record and retain an image pattern, and of the magnetic-attractive properties of other ferrous materials to assume the shape and opacity of the image, and in turn transfer it to a permanent support. The following advantages are claimed for the process: economy and speed of operation, permanence of image and ability to record any information which is available in signal form, such as instrument data, facsimile transmission or scanned images. Three references. *Photographic Engineering* 3, No. 1, 1952, Pages 47-8. The Journal is published by the Franklin Institute of the State of Pennsylvania, Prince and Lemon Streets, Lancaster, Pa.

GRAPHIC CHEMICALS. *Chemical Week* 69, No. 19, November 10, 1951, Page 38. Two new Minnesota Mining and Manufacturing Company products are discussed: a heat-sensitive (infrared) duplicating paper and a pre-sensitized aluminum offset plate. The heat-sensitive paper consists of a black backing coated with an opaque, white chemical composition. On exposure, the coating melts and re-solidifies to a transparent window, forming a black image. The offset aluminum plate is coated with a u.v. sensitive emulsion. The emulsion is normally water receptive, becomes water repellent, on exposure. 20-30,000 impressions are claimed. These products are in the test marketing stage but early expansion is planned.

* PLANOGRAPHIC PRINTING. *U. S. Patent 2,582,347.* Douglas A. Newman. *Official Gazette* 654, No. 3, January 15, 1952, Page 750. 24. A planographic plate having an ink-receptive water-repellent image thereon and having a substantially solid hydrophilic film comprising essentially a water insoluble carboxymethyl cellulose compound forming a mask around the image over the background of the plate.

DIRECT IMAGE PLATES. A. G. Fegert. *Printing Magazine* 76, No. 5, May, 1952, Pages 70-1 (2 pages). A new process for direct image plates was shown at the new plant of Standard Rate and Data Service, Inc., Evanston, Illinois. A light sheet of paperback aluminum foil, grained by dry sandblasting, is placed on an inked four-page letterpress form and an impression pulled. On its removal from the proof press, the plate is etched and gummed and then "debossed" to flatten out the indentations made by the type on the proofing press.

PLATEMAKING — CHEMISTRY

HYDROPHOBIC FILMS. George J. Kahan. *Journal of Colloid Science* 6, No. 6, Pages 571-5 (5 pages). Hydrophobic films are obtained from solution of wetting agents in aqueous solutions. Hydrophobic films are formed on metals regardless of the sign of the charge of the polar group, while only cationic wetting agents form films on glass. The difference in the behavior of potassium stearate and sulfated or sulfonated wetting agents is shown with the dipper technique. The inhibition of film formation by certain colloids is shown.

STUDIES IN POLYELECTROLYTES. II. GUM ARABATE. Sadhan Basu, Pares Ch. Dasgupta and Anil K. Sircar. *Journal of Colloid Science* 6, No. 6, Pages 539-548 (10 pages). Measurements of viscosity with varying concentration of solute, added sodium chloride, and the extent of neutralization of the solutions of gum arabate and arabic acid have been reported. A connected explanation for all the different observations has been formulated by the assumption of the existence of flexible chain molecules in solutions of gum arabate. From the same considerations the effect of pH variation with alkali on the relative viscosity of gum arabate solution has been attributed to the effect of soduim ion from alkali rather than the particular pH value.

* PROTEINS AT INTERFACES. C. W. N. Cumper and A. E. Alexander. *Revs. Pure Applied Chem.* (Australia) 1, 121-51 (1951). A review of work on the properties of protein films at air-water and oil-water interfaces. 157 references. *Chemical Abstracts* 46, 6, March 25, 1952, Column 2377. *Chemical Abstracts* is published by the American Chemical Society, 1155, 16th Street, N.W. Washington 6, D. C.

* PROPERTIES OF POLYVINYL COPYING INTERLAYERS (IN OFFSET PRINTING). A. A. Sinegub-Lavrenko, O. Ya. Fedotova and E. S. Venkova. *Poligraf. Proizvodstvo* 1951, No. 11, Pages 6-9. Polyvinyl alc. coatings used in place of gum arabic and other natural colloids form insol. tough films with oxidizing agents which permit treatment of the printing form with aq. solns. For removing the film in blank spaces from Cu and Zn 2-3% HNO_3 or H_2SO_4 is good. Removal from Al surface is difficult or impossible. HCl or H_2SO_4 at 0.3-0.5% concn. do not dissolve the film and cause only little swelling. Apparently these acids act by reduction of residual dichromate and resulting O goes for further hardening of the films. $FeCl_3$ solns. in H_2O dissolve hardened films on strong heating and unhardened ones at lower temps.; $FeCl_3$-EtOH solns. do not dissolve the films. Treatment of film-coated Al with $FeCl_3$ soln. causes H evolution and the film floats off. Polyvinyl alc. made by acid hydrolysis can be used in such films for pos. copying on Al after addn. into the light-sensitive soln. of a base (NH_3 or Na_2CO_3). For removal of the film from blanks on Al surface, the addn. of base to pH 9.5-10 is absolutely essential. Borax added to the chromate method of hardening the films increases their soly. and swelling. Light-exposed films swell less than unexposed ones the results being approx. proportional to duration of exposure. For best results on Al surfaces 0.15-0.16% borax is added to 3% polyvinyl alc. soln., with 3-4% NH_4 dichromate as hardening agent. *Chemical Abstracts* 46, 10, May 25, 1952, Columns 4845-6. Poligraf. Proizvodstvo is published by U. S. Orlikov Pereulok 3, Moscow, U. S. S. R.

* LIGHT-SENSITIVE COMPOSITIONS AND PLATES FOR PHOTOLITHOGRAPHY. *U. S. Patent 2,574,258.* Frederick H. Frost and Frederic E. Brinnick. *Official Gazette* 652, No. 1, November 6, 1951, Pages 233-4. 1. A sensitizer composition for photosensitive planographic printing plates comprising an acqueous vehicle, a water-soluble hexavalent chromium compound of the group consisting of chromates and dichromates, a liquid to semiliquid, unsaturated, organic, oily to fatty material capable of reacting with bichromate in the presence of actinic light to form a coherent solid film and a water-soluble phosphate, the weight ratio of said chromium compound to said material being within the range from 1 to 8 parts of the chromium compound to 4 parts of said material, and said composition containing from .5 to 3 percent by weight of said phosphate and having a pH value within the range from 3 to 9.

* CHEMICAL DEPOSITION OF METALS. *U. S. Patent 2,560,979.* Leopold Pessel. *Chemical Abstracts* 45, No. 22, November 25, 1951, Column 10183. Metallic coatings are deposited from solns. contg. 2,4-pentanedione (I),

which speeds deposition and makes the deposit hard and bright. H_2O should be present. Thus, steel is immersed, in a soln. comprising 10-30% I and 7% $CuSO_4$. A hard, brilliant Cu film is formed in seconds. Ag, Pd. Cu, Ni, Bi, Pb, Cd, Se, and Te may be deposited by this method. For high concns. of I, a co-solvent, such as diacetone alc., may be used.

HOW DOES pH AFFECT SHELF LIFE OF PLATE COATING? *Modern Lithography* 19, No. 11, November, 1951, Pages 37 and 115 (2 pages). A brief summary of LTF study of the effect of pH on the shelf life of bichromated albumin coating solutions. A series of coating solutions were prepared having a pH range of 6.9 to 9.1 and were allowed to age at room temperature. It was found that the storage time necessary for the above solution to reach the same reddish brown color was a direct function of the pH; it required progressively longer storage time as the pH increased. While the actual length of time varied with different lots of albumin and bichromate, the relationship between the pH and shelf life remained the same. The effect of the higher pH values on coating sensitivity can be offset by allowing the freshly coated plates to stand one hour before exposure. From *Research Progress* No. 23, obtainable from LTF, 131 E. 39th St., New York 16, N. Y., for 50 cents to members, 85 cents to non-members.

SPECTRAL SENSITIVITY OF PHOTOSENSITIVE ACID RESISTS. Brian O'Brien, Jr. *Journal of the Optical Society of America* 42, 2, February, 1952, Pages 101-3 (3 pages). Several resins, both synthetic and natural, used as acid resists in photoengraving, are rendered photosensitive by the addition of alkali dichromates. The mechanism of this photosensitization is not entirely clear, and the spectral sensitivity of the reaction for widely different resins may be of aid in a study of the reactions involved. In addition, such sensitometric data are useful in the practical application of the resists. Aluminum plates, coated with the resins, were exposed in a medium quartz spectrograph using a controlled white flame arc and rotating logarithmic spiral sector to produce wedge spectra. Calibration of the spectral energy incident on the plate was made from 2500A to the long wavelength sensitivity limit of the material at 5000A. Spectral sensitivities for the several resins are qualitatively similar when expressed in terms of incident energy. Coating thicknesses are of the order of 1 micron. At this thickness only a fraction of the incident energy is absorbed, as shown by transmission spectra through similar coatings on crystalline quartz plates.

PLATEMAKING — METAL SURFACES

* THE SURFACE TREATMENT OF ALUMINUM AND MAGNESIUM. V. F. Henley. *Light Metals* 14, 378-88 (1951). A review of mechanical and chemical surface preparation methods for Al and Mg. These include sand and shot blasting, emery finishing, grease mopping, finish polishing, scratch brushing, acid pickling, alk. etching, alk. cleaning, bright dipping, chemically produced surface coatings, electropolishing, anodic oxidation, and dyeing. *Chemical Abstracts* 46, No. 2, January 25, 1952, Column 392. *Light Metals* is published by Temple Press, Ltd., Bowling Green Lane, London E. C. 1, England.

TESTING FOR CHROMATE FILM ON ZINC PLATE. *Metal Finishing* 50, No. 1, January, 1952, Page 78. A drop of the following solution is applied. A red or purple color will develop within one minute if a chromate film is present.

Dist. H_2O	40 ml.
Glac. HAc	60 ml.
Diphenylcarbazide	1 gm.
Wetting agent (Sulfonated alcohol type)	0.1 gm.
HCl	15 ml.
Sodium hypochlorite (10-15% solution)	30 ml.
H_2O_2 (100 volume)	5 ml.

Mix in above order and let stand 24 hours.

* CHROMATE TREATMENT OF ALUMINUM. *U. S. Patent 2,568,936.* F. P. Spruance, Jr. *Metal Finishing* 50, No. 2, February, 1952, Page 79. In the art of coating aluminum to increase its resistance to corrosion and abrasion where the surface of the metal has been coated by subjecting it to the action of an acid acqueous solution the essential coating-producing ingredients of which are fluoride ions, dichromate ions and ions from the class of acids consisting of phosphoric and arsenic acids; the method which consists in treating a surface so coated with an acid aqueous solution containing, as its essential active material, a mixture of chromic acid with acid from the group consisting of phosphoric acid and arsenic acid; the concentration of chromic acid to be from 0.5 to 40 grams per liter and the concentration of acid from said group being the stoichiometric equivalent of from 2 to 30 grams per liter calculated as P_2O_5.

ZINC VERSUS ALUMINUM LITHOGRAPHIC PLATES. Charles F. King. *Inland Printer* 129, No. 1, April, 1952, Pages 58-60, 98-9 and 101 (6 pages). A discussion of the advantages and disadvantages in the use of zinc and aluminum for press plates including their characteristics on the press.

PLATEMAKING — ETCHING

* ETCH FOR OFFSET PLATE MAKING. *U. S. Patent 2,572,228.* Paul J. Whyzmuzis. *Official Gazette* 651, No. 4, October 23, 1951, Page 1076. 1. An etch which dissolves chromium without attacking copper, and which has relatively slow action on a light-hardened bichromated gum arabic film, consisting of a concentrated solution of a chloride of the group consisting of calcium and magnesium chlorides, a minor proportion of a concentrated solution of a chloride of the group consisting of stannic and chromic chlorides, and a small amount of acid sufficient to reduce the pH to below 2.0.

* PRINTING PLATE ETCHING. *U. S. Patent 2,585,864.* Karl Sollner. *Official Gazette* 655, No. 2, February 12, 1952, Page 579. 1. In preparing a metal printing plate of the group consisting of chromium, chromium alloys and nickel, incorporating in a magnesium chloride etching solution a catalytic amount of chlorplatinic acid, and etching the plate in such solution.

* ETCHING PROCESS. *U. S. Patent 2,599,914.* Paul J. Hartsuch and Carl Wachtl. *Official Gazette* 659, No. 2, June 10, 1952, Page 464. 1. The process of removing chromium from a chromium plated surface which comprises subjecting the surface to etching by applying thereto a solution containing aluminum chloride as its active ingredient and a salt selected from the group comprising zinc chloride, stannic chloride and ferric chloride as another ingredient.

PLATEMAKING — ALBUMIN

* COLLOIDAL CHROMIC HYDROXIDE AND ITS PRECIPITATING PROPERTIES. Miguel Amat. Rev. real acad. Scienc. exact., fis. y nat. (Madrid) 36, 1942, Pages 62-5. Colloidal solns. contg. 2 g. Cr(OH) per 1000 ml. can affect the *pptn. of proteins* found in the blood of man, the horse, and the ox. It can also ppt. the proteins in milk and in egg white, and the globulins of certain seeds. The sol is an excellent agent for the removal of albumin from org. fluids. *Chemical Abstracts* 45, No. 12, June 25, 1951, Page 4999.

PLATEMAKING — DEEP ETCH

A SIMPLIFIED APPROACH TO GUM COATING STENCILS. F. L. Cox. *Modern Lithography* 19, No. 7, July, 1951, Pages 49 and 51 (2 pages). This article describes a study of deep-etch coatings which was made in connection with their use in preparing Lithure bimetal plates. The results are presented in the belief that they will be found useful by lithographers in the use of gum coating generally. The effect of variables on the thickness of coating is evaluated and

those variables which must be controlled are specified. The effect of temperature and humidity on the combined exposure and development steps have been determined and are presented in the form of an exposure calculator. By use of this calculator, it is possible to develop deep-etch coatings similarly to photographic materials by using a standard developing time. This should improve the reproducibility of lithographic plates and reduce the number of rejected plates.

* WATER IN ALCOHOL DETECTED BY BLOTTING PAPER. *AMINCO Laboratory News* 8, No. 5, September, 1951, Page 2. Small quantities of water in alcohol can be detected merely by putting some alcohol on a specially treated strip of blotting paper. This new and delicate chromatograph test developed by Dr. J. E. C. Stringer of Vickers-Armstrongs, Newcastle-on-Tyne, England, and reported to the journal *Nature*, is expected to determine from one-tenth to one-half per cent of water in alcohol used for chemical purposes. Unlike beverage alcohol, that used for chemical work should contain little water and it is often desired to know just how much water is present. The alcohol being tested is allowed to soak up through a strip of blotting paper which is impregnated with two chemicals. The alcohol first reaches a zone of iron sulfate, which is dissolved in the water and not in the alcohol. When this salt, picked up by the water, reaches the area containing potassium ferricyanide, a blue coloration consisting of ferric ferrocyanide is produced. The extent and intensity of the coloration depends upon the amount of water present. American Instrument Co., Inc., 8030-8050 Georgia Avenue, Silver Spring, Maryland.

THE DEEP ETCH STENCIL: REMOVE IT OR NOT?—IT DEPENDS ON THE COLLOID. From *Research Progress* No. 24; *Modern Lithography* 20, No. 1, January, 1952, Page 38. Research by the Lithographic Technical Foundation has shown that the thin, invisible film of the gum arabic stencil which remains after the rest of the stencil is scrubbed off should be removed with a dilute solution of hydrochloric acid if the plate is to be etched with CMC. The reason for this is that CMC will desensitize the plate better. If a gum arabic etch is to be used, there is little gained by the above treatment. (Copies of Research Progress can be obtained from LTF, 131 E. 39th St., New York 16, N. Y., at 50 cents to members, 85 cents to nonmembers.)

* PHOTOGRAPHIC PRINTING PLATE. *U. S. Patent 2,598,189.* William G. Mullen. *Official Gazette* 658, No. 4, May 27, 1952, Page 1084. 1. A method of making an intaglio printing plate which comprises preparing a support having on one surface a relatively heavy base coating of photosensitizable, substantially water insoluble, water-sorptive hydrophilic colloidal selected from the group of materials consisting of proteins, pigmented proteins, polyvinyl alcohols and mixtures thereof bonded to said support, a relatively thin intermediate coating adhering to said base coating and comprising water-soluble photosensitizable carboxyl methyl cellulose and arabic composition, and a top coating comprising of water-soluble, photosensitizable, hydrophilic colloidal selected from the group of materials consisting of proteins, pigmented proteins, polyvinyl alcohols and mixtures thereof adhering to said intermediate coating, photosensitizing the top, intermediate and base coatings, exposing image-defining areas of the photosensitized coatings so as to produce water-insoluble grease-receptive printing areas and water-soluble, grease-repellent, non-printing areas, applying to the surface of said top coating a film of greasy material, subjecting the coatings to an aqueous treatment effective to wash off the greasy material from said non-printing areas, together with the underlying water-soluble top and intermediate coatings, and subjecting the coatings to a further aqueous treatment to effect

swelling of the unexposed areas of the base coating to a level above the printing areas of the top coating.

PLATEMAKING — POLYMETALLIC

* PLANOGRAPHIC PRINTING PLATES. *British Patent 629,201.* Time, Inc. *Abridgement of Specifications* Group XVI, Page 86. A process of preparing a planographic printing plate comprises immersing the surface of a metallic plate on a plating bath (see Group XXXVI), wherein it is plated electrolytically with chromium. Before the plate, of copper, for example, is immersed in the bath a resist image is applied to and baked on the surface, the exposed part of which is then cleaned, for example, by a solution of glacial acetic acid and common salt, and is then etched with dilute concentrations of phosphoric acid, nitric acid, ferrosoferric dionol, or the like. After the plating operation the image is removed, for example, by sodium cyanide and the plate is treated with one or more of such chemicals as dilute phosphoric acid, alcohol, sodium hexametaphosphate, boric acid, sodium alkyl sulphate of high molecular weight and lactic acid whereby the exposed copper portions of the plate are grease receptive and water resistant, while the chromium-plated surfaces are water receptive. Alternatively, the whole surface of the printing plate is plated electrolytically with chromium and a resist image is subsequently applied to the plate. British patents may be secured from the Patent Office, 25 Southampton Bldgs, London, W. C. 2, England, for approx. 36 cents.

* PHOTO-MECHANICAL PRINTING SURFACES. *British Patent 626,844.* Akomfina Akt.-Ges. *Abridgement of Specifications* Group XX, Page 103. The printing surface is produced by treating a plate of metal, or one having a metallic surface, in a lye bath, coating thereon a light-sensitive layer, copying the matter to be printed from a diapositive thereof, developing to remove the unexposed parts of the layer, coating the metal thus laid bare with a solution containing at least one metal salt which reacts with the metal of the plate to form a firmly-adhering metallic layer, preferably applying thereto an ink-receptive varnish coating, and thereafter removing the remainder of the sensitive layer. The ground plate may be of zinc, aluminum or aluminum alloy; the lye bath may contain at least one substance from each of the groups (a) soda, potassium cyanide, calcium chloride, and (b) potassium or sodium hydrate; the sensitive layer may consist of bichromated gum arabic containing a calcium salt (e.g. chloride or hydrosulphite) and formalin or both, and maybe also colouring matter; the metallising substance may consist of an alcoholic solution of one or more of copper chloride or oxide, antimony chloride, oxide, sulphide or sulphate; and the varnish coating may consist of a natural or artificial resin. The bichromated gum layer may be developed with cold water and removed with lukewarm water. The printing layer, when no longer of use, may be removed from the plate with the usual media, e.g. pumice meal, nitric acid, etc., or by a bath containing any or all of chromic, nitric, and hydrochloric acids to which calcium chloride may be added. Reference is made also to procedure commencing with a negative, and to transfer and intaglio work. Specification 23048/39, as open to inspection under Section 91, is referred to. British Patents may be secured from the Patent Office, 25 Southampton Bldgs, London, W. C. 2, England, for approx. 36 cents.

* PRINTING FORM WITH BIMETALLIC SURFACE. *U. S. Patent 2,558,504.* Claes B. Aller. *Chemical Abstracts* 45, No. 21, November 10, 1951, Column 9453. Printing forms prepd. in the disclosed manner give more exact reproductions in that the fine details and printing points are not attacked during the etching by material from adjacent surface areas. In known methods this effect may result in perceptible changes in the shade values obtained in the reproduction. As an example a metallic

base may be plated with Cu or Sn, coated with image-forming nonconducting material, then removed from the plate and the surface of the plate is etched with a soln. of an alkali sulfide or polysulfide. This etchant will remove all the Cu or Sn leaving the Zn or Cd covered areas intact.

* BIMETALLIC OFFSET PRINTING FORMS. A. L. Rozenblatt and K. E. Ginzburg. *Poligraf. Proizvodstvo* 1951, No. 2, Pages 13-15. The best metal for the printing element is Cu, while blank spaces are best made of Ni, which is electrodeposited on the developed Cu form, made water-repellent by treatment with K xanthate and Fe $(NO_3)_3$. The Ni portions of the form are made water-repellent by treatment with ferrocyanide. After use, the Ni is removed electrolytically and the Cu form is again usable after suitable treatment. Typical formulations of the treating baths are cited. *Chemical Abstracts* 45, No. 13, July 10, 1951, Page 5843.

* PHOTOLITHOGRAPHIC PRINTING PLATE. *British Patent 662,708.* Thomas T. Archer. *Tin-Printer and Box Maker* 28, No. 328, May, 1952, Page 12. The grease is removed from a polished stainless steel surface. The plate is subjected to electrolysis in a phosphoric acid bath and is copper plated electrolytically in an acid copper bath. The plate is coated with bichromated polyvinyl alcohol solution. It is placed with the negative of a desired image in a frame, and exposed to sunlight or arc lamps. Washing with water is effected. The plate is placed in an iron perchloride bath to remove the copper background and is washed with water. The bichromated polyvinyl alcohol image is removed in a stencil removing bath, leaving a copper image. British patents may be secured from Patent Office, 25 Southampton Bldgs, London, W. C. 2, England, for approx. 36 cents.

* BIMETALLIC PRINTING FORMS. *U. S. Patent 2,584,317.* Claes B. Aller. *Chemical Abstracts* 46, No. 10, May 25, 1952, Column 4406. Bimetallic printing forms used in planographic printing are made by depositing electrolytically a metallic protective image (I) on the surface of a galvanically deposited intermediate metal layer (II) which rests on the base layer (III) of a different metal. The adhesion between these layers is enhanced by thin layers of Ag. II is Cr, a Cr-containing alloy, or stainless steel as water-retaining metal and III is Cu, brass, or bronze as ink-retaining component. In this case I is Fe, Pb, Sn, or their alloys. The etching agent (IV) which is to dissolve the unprotected portions of II but not I or III, is HCl in this case. If, however, II is Cu, then IV is CrO_3. When II is Cu, Zn and Cd can be used as I, if IV is a sulfidizing agent, such as alkali metal sulfide or polysulfide which converts II into an easily removable sulfide. I is removed before printing with dild. H_2SO_4.

PLATEMAKING — PAPER PLATES

* LITHOGRAPHIC PRINTING PLATE. *U. S. Patent 2,561,353.* James Finno. *Official Gazette* 648, No. 4, July 24, 1951, Page 1045. 1. A planographic printing plate comprising an unbacked, singleply, unsized sheet of uncalendered amyloid parchment paper having a minutely fibrous fine grain surface characterized by low gloss and low smoothness values and having its non-image area coated with an ink-repellent dampening solution composed of an aqueous solution of glycerine, sodium sulfate, boric acid and gum acacia in the proportions of from approximately 12.8 ounces to approximately 64 ounces by volume of glycerine, from approximately 1 to approximately 16 ounces of sodium sulfate, from approximately 1 to approximately 6 ounces of boric acid, and from approximately ¼ ounce to approximately 3 ounces of gum acacia, the foregoing proportions being for one gallon of solution, said dampening solution producing a non-penetrating and non-saturating film on the non-image area of the plate, whereby stretching, wrinkling or tearing of the plate is prevented.

* SINGLY COATED PLANOGRAPHIC PRINTING PLATES AND METHODS OF MAKING SAME. *Canadian Patent 475,218.* Stephen V. Worthen. *Bulletin of the Institute of Paper Chemistry* 22, No. 1, September, 1951, Page 84. A method is described for the manufacture of paper-base planographic printing plates. As an example, a sheet of wet-strength paper is coated on one side with a composition which contains 100 parts of clay and 18 parts of casein dissolved in ammonia. About 15 pounds (dry weight) of coating is applied per ream (25 x 38—500). The coating is dried and calendered and then washed with a strongly ammoniacal solution to which 16% by weight of zinc chloride has been added. The sheet is dried and used as an offset plate. One thousand prints can be made from the plate without objectionable wet-through, and the printing quality is good. Institute of Paper Chemistry, Appleton, Wisconsin.

PLATEMAKING — RESINS AND PLASTICS

* LIGHT-SENSITIVE RESINS. *U. S. Patent 2,566,302.* Charles F. H. Allen and James A. Van Allan. *Chemical Abstracts* 45, No. 22, November 25, 1951, Columns 10665-6. Copolymers useful as photochem. resists can be produced by one of two methods: (1) reaction of polystyrene with a light-sensitive acid chloride in the presence of $AlCl_3$, and (2) reaction of the acid chloride with the monomeric aryl compd., followed by polymerization. Thus, 26 parts polystyrene in 260 parts CS_2 is mixed with 7 parts cinnamoyl chloride and cooled with water. $AlCl_3$ 11.5 parts is added in small portions. The mixt. is stirred for 1 hr. with gentle heating. After drying, an almost white, solid copolymer contg. 1 cinnamoylstyrene unit to each 6 styrene units in the mol. is obtained. Altering the proportions of the ingredients produces copolymers with a corresponding variation of groups in the resulting product. For good solv. and sensitivity to light, 5-18 moles of styrene to 1 mole of cinnamoylstyrene in the product is satisfactory. Suitable solvents to remove the unexposed copolymer are chlorobenzene, xylene, or decahydronaphthalene.

PLATEMAKING — GRAINING

GRAINING OF LITHOGRAPHIC PLATES. Frank E. England. *National Lithographer* 58, No. 12, December, 1951, Pages 28-29 (2 pages). Optimum procedures and materials for graining zinc and aluminum lithographic plates are presented.

CONTROLLED AND CONSISTENT GRAINING. *Modern Lithographer and Offset Printer* 67, No. 9, September, 1951, Pages 177-178 (2 pages). LTF suggestions as to marble culling and addition are recommended. Incorrect marble size distribution results in uneven marble wear and skidding of marbles which yield flat, scratchy plates. New ⅝ in. marbles are added to replace removed ones under 9/16 in.

PAPER: GENERAL

* THE AMOUNT OF PRINTING INK TAKEN BY PAPER IN RELATIONSHIP TO ITS SMOOTHNESS. E. Leidl. *Allg. Papier-Rundschau* No. 15, August 13, 1951, Page 644 (in German). The amount of printing ink which paper will take depends upon several factors (printing pressure; viscosity, tinctorial power, and drying period of the ink; and absorptivity, air permeability, flexibility, and smoothness of the paper) which may accelerate or retard, improve or deteriorate the printing process. The present article deals with the smoothness of paper, which is a surface property; uncalendered, machine-finish, machine-glazed, dull-, medium-, and high calendered, and supercalendered papers are available. Every paper exhibits the defect of two-sidedness; the rougher wire side may be readily recognized in uncalendered paper although the calendering process does not entirely eliminate two-sidedness. Not only smoothness, but also sizing, loading, and dyeing are influenced during sheet formation on the paper machine; all these factors cause variations in the amount of printing ink taken up by either wire or felt side. The former under otherwise identical conditions usually takes more ink which penetrates much deeper into the sheet than the felt side, so that in machine-glazed paper, showthrough may be noticeable on the felt side, whereas the wire side does not exhibit any traces of the print from the other side. Calendered papers react differently. High calender pressures decrease the softness and flexibility of the paper so that the ink must be transferred at high printing pressures. Even when the finest and most expensive inks are employed, they cannot form the correct bond with the highly densified paper structure. *Bulletin of the Institute of Paper Chemistry* 22, No. 3, November, 1951, Pages 196-7. Institute of Paper Chemistry, Appleton, Wisconsin.

* QUALITY CONTROL OF PRINTING PAPER. G. R. Cranor. *Paper Market*, August, 1951, Pages 48-9. The effect on printability of the following characteristics of paper is discussed: physical strength, surface strength, formation, smoothness, softness, porosity, oil absorption, moisture, and opacity. Tests for a few of these factors are described briefly. *Bulletin of the Institute of Paper Chemistry* 22, No. 3, November, 1951, Page 194. Institute of Paper Chemistry, Appleton, Wisconsin.

PHOTOMICROGRAPHY OF PRINTING PAPER SURFACES. I. M. Bernstein. *Modern Lithography* 19, No. 8, August, 1951, Pages 28-31, 89 and 91 (6 pages). Photomicrographs of a number of papers were presented to demonstrate the relation of the surface to printability. A shadowed photomicrograph of newsprint shows its open texture and slack sizing which permit ink retention in the capillary interstices. Comparison of shadowed photomicrographs of unprinted (S&SC Stock) and unshadowed printed stock shows that not all of the low spots between fibers can be reached by the inked plate. In contrast, the litho stock with an offset print shows that all the areas are reached by the inked blanket. The surfaces of bleached and unbleached kraft, coated paper and board, and cast-coated paper are also shown to illustrate their properties.

HERE IS THE IMPORTANCE OF PAPER IN OFFSET LITHOGRAPHY. Charles W. Latham. *American Printer* 132, No. 11, November, 1951, Pages 37, 56, 58, 60, and 62 (5 pages). The author describes the manufacture of paper and the properties important to the lithographer. Grain, two-sidedness, density, hygroexpansivity and the effects of these properties on register and printing are discussed. Poor register due to tight or wavy edges is caused by changes in sheet dimensions with changes in moisture content. Suggestions for correcting this condition are made. Other problems are also mentioned.

THE INFLUENCE OF PULP CHARACTERISTICS ON PRINTING PAPERS. Bruce W. Wright. *TAPPI* 34, No. 10, October, 1951, Pages 133-6A (4 pages). The author shows how the quality of a printing paper can be influenced by the proper selection of the furnish and discusses the characteristics in the finished sheet (particularly of coated magazine grades), which are affected by the individual pulps, including uniformity, smoothness, compressibility, resilience, opacity, over-all strength, pick resistance, and ink receptivity and absorption. 1 table and 4 figures. *Bulletin of the Institute of Paper Chemistry* 22, No. 3, November, 1951, Pages 187-8.

* EFFECT OF SURFACE ROUGHNESS ON RATE OF WATER ABSORPTION IN PAPER. A. P. Arlov. *Norsk Skogind.* 5, 12: 403-8 (December, 1951) (in English; Norwegian summary). The influence of variations in the surface roughness of paper on its rate of water absorption was studied. Sized and unsized handsheets were formed from a bleached sulfite pulp beaten in a Valley beater and P.F.I. and Lampen mills. The specific volume, surface roughness, and decrease in contact angle per second were measured. The results showed that a sized paper with an initial contact angle exceeding 90° absorbs water at a slower rate the rougher the surface and the bulkier the sheet. In an unsized paper, on the other hand, the rate of water absorption is greater the rougher the surface and the bulkier the sheet. A summary of the general theory of the contact angle (its measurement and hysteresis and the movement of liquids in capillaries) is given, and the present results are interpreted in terms of the effect of contact angles on the movement of liquid in conical capillaries. Seven beater-sized commercial paper brands with a pronounced two-sidedness in both rate of water absorption and surface roughness were examined, and their rate of water absorption was found to be greater on the smoother side. This is in accordance with the laboratory experiments. 2 tables, 8 figures, and 6 references. *Bulletin of the Institute of Paper Chemistry* 22, No. 7, March, 1952, Pages 516-7. *Norsk Skogindustri* is published at Stortingsgaten 14, Oslo, Norway.

*PAPER HAVING IMPROVED PRINTING CHARACTERISTICS. *U. S. Patent 2,581,186.* Barrett K. Green. *Official Gazette* 654, No. 1, January 1, 1952, Page 278. 1. Paper filled with solid particles the major portion of which are zeolite material having internal adsorbent surfaces.

HOW TO USE ALGIN FOR SURFACE SIZING AND SURFACE CONTROL. V. V. Vallandigham, A. L. Magnuson, and A. Miller. *Paper Industry* 33, No. 10, January, 1952, Pages 1176-7 (2 pages). The necessity for sizing in paper to be printed is mentioned. The techniques necessary to use algin size to best advantage along with its disadvantages are discussed.

SAVING PRESS TIME THROUGH STATISTICAL CONTROL OF PAPER. Donald Macaulay. *Modern Lithography* 20, No. 2, February, 1952, Pages 31-3, 109 and 111 (5 pages). Statistical control of paper is a new management tool for increasing quality. It can get a more uniform appearance to the printed material while lowering its cost. By using this method, uniformity can be evaluated. A number of cases where it is being used and has helped are given.

PAPER COATING

*AGREEMENT ESTABLISHED BY THE TECHNICAL COMMISSION COMPOSED OF MANUFACTURERS OF BASE PAPERS FOR COATING AND PRODUCERS OF COATED PAPERS. *Papeterie* 73, No. 5, May, 1951, Pages 257 and 259; *Rev. Papiers et cartons* 14, No. 10, June 1, 1951, Pages 277-9 (in French). A technical commission formed by members of both manufacturing groups established the essential requirements which a suitable base paper for coating should possess. The

following factors received consideration; they are listed in the order of their importance: cleanliness of the stock, flatness, dimensional stability, breaking length, sizing, porosity, moisture content, uniform thickness and basis weight, uniform winding of the rolls, permissible stretch in the machine and cross-machine directions, and finish and grain. *Bulletin of the Institute of Paper Chemistry* 22, No. 1, September, 1951, Page 29. Institute of Paper Chemistry, Appleton, Wis.

THE TRIST PAPER COATING SYSTEM. A. Ronald Trist. *Paper-Maker and British Paper Trade Journal* 122, No. 3, September, 1951, Pages 174, 177-8 (3 pages); reprinted from *Technical Association of the Pulp and Paper Industry*. This system uses a coating consisting of a water-in-oil emulsion, a colloider to make this emulsion, and a coater to apply it. Any pigment used in making paint or printing ink may be used in the oil phase of the emulsion. A resin soluble in the oil is used as the binder. Ten to twenty per cent of water is in the emulsion. Coating weights between 1½ and 7½ pounds per ream of 3,000 sq. ft. are deposited; speeds of 1,000 to 3,000 ft. per minute and rapid drying are attained. It is claimed that the resultant surface is resilient, smooth, slightly elastic, free of crinkle, and non-absorbent to ink and water. The last property improves brilliance of print and improves register in lithography by hindering water sorption.

THE REQUIREMENTS OF COATED PAPERS FOR OFFSET LITHOGRAPHY. W. H. Bureau. *Technical Association of the Pulp and Paper Industry* 34, No. 10, October, 1951, Pages 110A-112A (3 pages). The differences in offset and letterpress processes and their effects on paper requirements are discussed. Necessary characteristics for satisfactory offset coated papers are dimensional stability, resistance to body stock peel and picking or coating lift, flatness, ink receptivity, correct acidity, and cleanliness.

LITHOGRAPHING ON COATED PAPER: 1. R. F. Reed. *National Lithographer* 59, 3, March, 1952, Pages 26-9 (4 pages). The author discusses the differences between coated and uncoated paper in regards to ink absorbency, water absorbency, pick strength, dimensional stability, curl, moisture content, and chemical effects. Also covered are advantages and disadvantages of running coated paper and what should be done before starting to print.

PAPER SELECTION

PAPER AND BOARD CHARACTERISTICS THAT AFFECT INKS AND PRINTABILITY. L. F. Engelhart. *Technical Association of the Pulp and Paper Industry* 34, No. 9, September, 1951, Pages 112A-121A (10 pages). Paper and board printability is affected by surface smoothness, ink receptivity, pick resistance, color opacity, dimensional stability, body strength, chemical reactivity, abrasiveness, formation and grain, moisture content, and uniformity. The author discusses the importance of each of these factors.

PAPER TROUBLES

MAKE EVERY SHEET COUNT. *Graphic Arts Monthly* 23, No. 7, July, 1951, Pages 68, 140 and 142 (3 pages). Wastage of paper due to lack of register in multicolor jobs is most commonly caused by failure to keep paper flat. Non-uniform dimensional changes in paper due to changes in moisture content result in tight or wavy edges. Tight edges are caused by storage of paper in a lower relative humidity than exists in the paper; wavy edges, by storage in a higher RH. Differences in temperature between paper and surrounding air change the RH at the paper surface resulting in tight or wavy edges. During printing, retention of moisture transferred from the blanket is least likely to occur if the paper RH is 5-8% above pressroom RH.

ELIMINATION OF STATIC ELECTRICITY. Lewis E. Walkup. *Graphic Arts Monthly* 23, No. 7, July, 1951, Pages 65-66 and 132 (3 pages). Static electricity is generated whenever paper is brought into contact with any other solid object. It is conducted away by the paper when its moisture content is high enough—in contact with 40% relative humidity air or higher. Air at any moisture content is an insulator; so when paper conductivity is too low, air conductivity is increased by ionization caused by flames, sharp points near the charged paper, high potentials applied to sharp points, radioactive materials, and ultraviolet light. The paper manufacturer is partially responsible for the moisture content of the paper and therefore its ability to drain away static charges; but it is very unlikely that any static charge could be retained by the paper from the manufacturing process to the printer.

* WRITHING FIBRES CAN WRECK THE JOB. W. H. Wass. *British Printer* 64, No. 379, July-August, 1951, Pages 20-23. The distortion of paper as a result of changing humidity conditions in the pressroom and in the press itself is discussed. Some suggestions for minimizing the variations in the size of paper include the purchase of preconditioned paper which has a slightly higher moisture content than the standard R.H. at the press and the control of the R.H. of the atmosphere in which the paper is stored. 10 figures. *Bulletin of the Institute of Paper Chemistry* 22, No. 1, September, 1951, Pages 40-41. Institute of Paper Chemistry, Appleton, Wisconsin.

OVERCOMING DIFFICULTIES IN THE PRINTING OF MACHINE FINISHED PAPERS. E. Aiken. *Pulp and Paper Magazine of Canada* 52, No. 12, November, 1951, Pages 100-101 (2 pages). The author discusses paper problems the printer experiences. They include edge-bound sheets, curl, dust, irregular cut or broken sheets, picking, excessive ink absorbency, lack of uniform finish, lack of opacity, static, and brittleness.

PAPER TESTING

* MEASUREMENT OF PAPER GLOSS. E. Liebert. *Das Papier* 5, 1951, Pages 191-4. As a control of smoothness directly after calendering, a photoelectric glossmeter was devised for measuring the gloss of a running web of calendered paper. Data showing the relationship of smoothness to gloss are given. *Chemical Abstracts* 45, No. 20, October 25, 1951, Column 9267. Das Papier is published by Eduard Roether Verlag, Liebigstrasse 24, Darmstadt, Germany.

* THE MEASUREMENT OF DIMENSIONAL STABILITY OF PAPER WITH A MOUNTABLE EXPANSIMETER. H. H. Emschermann and J. Kruse. *Das Papier* 5, No. 13/14: 299-302 (July, 1951) (in German). An instrument is described which was developed by M. Pfender for use in steel construction and which is now applied to the measurement of the dimensional stability of paper and board when subjected to varying moisture conditions. The conditioned paper samples are placed between two glass plates equipped with bore holes into which the stationary and the movable foot of the instrument fit. The expansion of the measured distance between the two feet is magnified by a lever transmission and recorded upon a dial. Details of the construction of the instrument, directions for sample taking and the measuring procedure, and the accuracy of the results in comparison with other methods are given. The instrument is made by F. Staeger, Berlin. 3 tables, 2 figures, and 3 footnotes. *Bulletin of the Institute of Paper Chemistry* 22, No. 1, September, 1951, Pages 36-37. Institute of Paper Chemistry, Appleton, Wisconsin.

* SOME FACTORS AFFECTING THE STRESS-STRAIN CHARACTERISTICS OF PAPER. Part 1. Influence of temperature. Part 2. Influence of relative humidity. Olle Andersson and Edward Berkyto. *Svensk Papperstidn.* 54, No. 13, July 15, 1951, Pages 437-44 (in English; German and Swedish summaries). (1) The influence of temperature on the stress-strain characteristics of paper has

been studied for a temperature range of −50 to +150°C. The slope of the stress-strain curves and the tensile strength have both been found to decrease with temperature. Since a sound, purely theoretical basis for the interpretation of the results was lacking, a purely empirical interpretation was made. Various equations were fitted to the data by the method of the least mean square, and the goodness of fit was measured by calculating a correlation coefficient. The linear relationship was found to be most suitable for the effect of temperature and equations of the following form was fitted to all data: $o = (Ae + Be^2) + (Ce + De^2)t$, where o is the stress (in kg.), e is the strain (% elongation), t is the temperature (in °C) and A, B, C, and D are constants. In a similar manner, linear equations were fitted to the breaking stress- and breaking elongation-temperature data. Further mathematical derivations can be obtained from these equations, for instance, a Young's modulus-temperature relationship. 3 tables, 2 figures, and 8 references. (2) The stress-strain characteristics of a newsprint and a machine-glazed kraft paper were examined over the entire humidity range. Sorption isotherms were determined for the two papers which permitted the comparison of the data as a function of water content. The results showed a rapid change of the shape of the curves at humidities between 60 and 80%. In contrast to earlier reported work, no maximum was found in the tensile strength at an intermediate R.H. The elongation curves in the cross-machine direction increased rapidly with R.H., but showed a tendency to level off at high humidity values. In the machine direction an actual reversal of the upward trend was observed at approximately 80% R.H. The initial slope of the stress-strain curve closely followed the trends observed for breaking stress. The curves for area under the stress-strain curves were less well-defined, but did show a maximu, probably near 60% R.H. The plotting of the data as a function of the water content of the sample indicated that, near and above the saturation point, the influence of water is not as marked as at lower moisture contents. 3 tables, 10 figures, and 8 references. *Bulletin of the Institute of Paper Chemistry* 22, No. 1, September, 1951, Page 50. Institute of Paper Chemistry, Appleton, Wisconsin.

* INVESTIGATIONS OF THE PRINTABILITY OF PAPER. J. F. Monroy. Paper presented at the American Chemical Society Paint, Varnish and Plastics Division Diamond Jubilee meeting. *Paint, Oil and Chemical Review* 114, No. 17, August 16, 1951, Page 12. The determination of printability by measuring some properties of the paper does not give satisfying results. By making proof prints on small paper samples instead, far more rapid and reliable results are obtained. Owing to the design of the proof-printing apparatus, in which strips of paper measuring 2x25 cm. are used, the thickness of the ink layer, printing pressure, cylinder covering, and printing velocity can be altered rapidly. Therefore, tests, which would otherwise involve days, can now be made within a few hours. By comparing the data found with practical printing, valuable particulars about the printing process in general were obtained. The printing velocity at which picking starts (picking velocity) decreases with increasing film thickness until the moment when the paper has reached its utmost ink saturation. That means that the picking velocity does not decrease with an ink film thickness of more than 5 to 8 p. This does not correlate with the theoretically measured maximum rupture energy at a film thickness of 20 to 30 p. This particular saturation means also the maximum attainable density for this paper. From the utmost density, the correct screen distance can be ascertained. The phenomenon of picking is closely related to the length of time during which actual printing lasts, and the angle at which the paper is separated from the form. The viscosity decrease of the ink on a press inking arrangement is restored immediately after the form has been inked.

FINDING PAPER GRAIN. Craig Spicher. *Printing Equipment Engineer* 81, No. 12, September, 1951, Page 25; 82, No. 1, October, 1951, Page 47. The wire and felt sides of a sheet of machine-coated paper may be determined by first finding the grain by folding the sheet and then tearing a semicircular corner of the sheet perpendicular to the grain. The tear should be made with a circular motion to show a splitting of the coating from the pulp. A similar tear should be made on the reverse side and results compared. The felt side shows the greatest removal of coating. 2 illustrations.

* RULE OF THUMB FOR PRINTING PAPERS. Jack Taylor. *Am. Paper Merchant* 48, No. 9, September, 1951, Pages 25, 62-63. A series of tests is presented which do not require scientific apparatus and which can be used by the paper merchant for determining the quality of paper for printing. These include tests for finish, formation, opacity, strength, surface sizing, caliper and bulk, bursting strength, pasted bristols and covers, coating, grain and curl and stretch. The information is taken from the author's book "The Characteristics and Functions of Printing Papers". *Bulletin of the Institute of Paper Chemistry* 22, No. 2, October, 1951, Page 126. Institute of Paper Chemistry, Appleton, Wisconsin.

* GLOSSOMETER. *U. S. Patent 2,578-625.* Kenneth Bowers and Thomas E. Mason. *Official Gazette* 653, No. 2, December 11, 1951, Page 580. 1. In apparatus for instantaneously measuring the gloss of one side of a running web of paper and continuously comparing this measurement with a similar measurement of the gloss of a given standard, comprising in combination, a fixed supporting bar extending across said running web and spaced therefrom; a casing adjustably mounted on said supporting bar to permit transverse movement of said casing across said web and having an aperture confronting said web; a light source positioned within said casing; a first mirror positioned between said light source and said web and inclined at an angle of about 52½° to the plane of said web to direct a first beam of light from said source through said aperture to said web at an angle of incidence of about 75°; a first vacuum-type phototube mounted within said casing at approximately the same distance from said web as said first mirror to receive said first beam after it is reflected from said web; a gloss standard having a plain ground glass surface of predetermined, uniform gloss characteristic mounted within said casing parallel to the plane of said web; a second mirror within said casing positioned on the opposite side of said light source from said web and inclined at an angle of about 142½° to the plane of said web to direct a second beam of light from said source onto said gloss standard at an angle of incidence of about 75°; a second vacuum-type phototube mounted within said casing at approximately the same distance from said web as said second mirror for receiving the reflected beam from said gloss standard; electrical measuring means mounted at a point remote from said casing and web and adapted to receive and compare the electrical signals created by said beams impinging on said phototubes, said measuring means comprising a vacuum tube bridge circuit and indicating meter responsive to the degree of unbalance of said bridge to indicate deviation of the gloss characteristic of said web from said gloss standard; and flexible conductors interconnecting said phototubes and said bridge circuits.

METHOD AND APPARATUS FOR TESTING PAPERS AND THE LIKE. *U. S. Patent 2,568,199.* Noel Martinet. A method and apparatus are adapted for the determination of the ink permeability of paper and cardboard. The sample to be tested is placed between two electrodes which are inserted in a measuring circuit and is brought into contact with ink under given conditions of pressure and temperature. The permeability of the sample under test is determined by the time required by the current to reach a given value in the measuring circuit

under constant-voltage conditions. *Bulletin of the Institute of Paper Chemistry* 22, No. 2, October, 1951, Page 156.

PAPER TESTING METHODS — No. 8, Second Series. "WHAT YOU SHOULD KNOW ABOUT STANDARD PAPER TESTS". Charles V. Morris. *Printing Magazine* 75, No. 11, November, 1951, Pages 58-61 (4 pages). The author discusses the importance of grain direction, caliper, basis weight, Mullen burst, stiffness or rattle, tearing strength, folding strength, tensile strength, ink absorption and density. Tests for grain, pasting, water penetration and absorbency, tub sizing, wax pick test, and groundwood fiber content are also described.

THE TESTING OF PAPER. James P. Casey. *Paper Industry* 33, No. 11, February, 1952, Pages 1325-7 (3 pages). The author discusses handling, use, empirical, and fundamental tests. Handling tests include rattling, folding, tearing, wetting, and looking through the paper for formation. Use tests include printing and corrugating. Empirical tests include burst, fold, abrasion, etc. Fundamental tests include density, hardness, smoothness, resistance to oil penetration, and stress-strain measurements. The problems involved in setting up paper specifications are also discussed.

* METHOD AND APPARATUS FOR TESTING PAPERBOARD. *Canadian Patent 479,932*. Robert C. McKee and George R. Sears. *Bulletin of the Institute of Paper Chemistry* 22, No. 6, February, 1952, Page 453. An instrument is designed for the measurement of the tearing properties of paperboard and the like. The apparatus produces a relatively straight tear without delaminating the board and thus provides test data which are direct measures of the tearing strength and the resistance to continued tear. In accordance with the method of the invention a paperboard sample is clamped along lines which are parallel to and spaced symmetrically from the line along which the tearing strength of the sample is to be determined. The clamped portions are then rotated relative to one another about an axis which is normal to the line along which the tear is to be produced, which bisects the length of the specimen along the proposed line of tear, and which passes through the center of the specimen (i.e., the axis falls midway between the outer plane surfaces of the specimen). In order to secure reproducible results and to test the property of continued wear rather than initial tear, the sample, before testing, is cut inwardly for a short distance at each end of the proposed line of tear, and the center of the sample is cut away to leave a symetrically located opening. 7 figures. Copies of this patent can be obtained from the Commissioner of Patents, Ottawa, Canada.

INSTRUMENTATION STUDIES. LXX. A STUDY OF INSTRUMENTS FOR THE MEASUREMENT OF OPACITY OF PAPER. III. THE WESTON OPACITY METER AND THE WELCH DENSICHRON. L. R. Dearth, O. H. Olson and J. A. Van den Akker. *TAPPI* 35, No. 5, May, 1952, Pages 185A-190A (6 pages). For the purposes of accurate research and the needs of commercial specifications, the opacity of paper should be measured and expressed as a contrast ratio. However, where one has established a correlation between light transmission and contrast ratio for the papers in production, a light transmission instrument has the advantage of speed and may prove to be satisfactory for the mill control of opacity. The present observational study was undertaken to test this possibility, using a Weston opacity meter and a Welch Densichron. The former expresses opacity as $(1-T)$, whereas the latter measures T, where T is the transmission of the paper. The instruments are described, and the conditions for stable operation are discussed. In order that the suitability of the instruments for the mill control of opacity might be judged, measurements of

TAPPI opacity and printing opacity (both contrast ratios) were made with a standardized Bausch and Lomb opacimeter, and observations of Weston (1—*T*) and Densichron *T* were taken for each of a series of 38 papers differing widely in basis weight, thickness, and type. The data obtained with the latter two instruments were plotted against TAPPI opacity and printing opacity. The charts thus obtained show generally good correlation but the deviations for individual papers may, in certain instances, be rather large. The data indicate, however, that a stable transmission instrument should be effective for the mill control of opacity if its calibration for the papers in actual production is checked against a standard opacimeter at reasonably frequent intervals.

INK: GENERAL

* GLOSS OF OIL VARNISHES. C. Salvi. *Pitture e vernici* 4, 1948, Pages 395-6. The gloss is influenced by the nature of the resin, oil, drier, and thinner, and the manner of preparation. For resins of the same class the gloss tends to vary inversely as the hardness of the resin. The more readily polymerizable oils usually give the best gloss; incorporation of oils such as grapeseed oil usually lowers the gloss. Rosin gives exceptionally glossy varnishes, and where duration is not essential, a varnish containing rosin 55, linseed stand oil 5, and thinner 40 parts is outstanding. It is easier to obtain good gloss with rosin-modified phenolic and maleic resins than with pure phenolic resins. The formulation of durable glossy finishes is discussed. *Chemical Abstracts* 45, No. 14, July 25, 1951, Column 6398. American Chemical Society, 1155 16th Street, N. W., Washington 6, D. C.

* THE RELATION OF PAPER AND INK IN PRINTING. J. Grant, R. B. Fishenden, and R. F. Bowles. *Paint, Oil and Colour Journal* 117, No. 2675, 1950, Pages 227-34. Paper given at a meeting of the London Section of the Oil and Colour Chemists' Association. Dr. Grant: From the point of view of the printer and ink manufacturer, paper-making is essentially a compromise, for processes that improve the paper in one direction may make it less acceptable in another. For example, beating improves paper strength, but reduces opacity; increases water and oil resistance, but increases set-off and drying problems. These disadvantages from the printing point of view can be minimized without deleterious effects on the paper, e.g., opacity is improved by addition of special loadings. Dr. Bowles: There must also be a very close relationship between the printing and printing ink industries. Methods of measuring the three most important physical properties of inks are discussed. The most recent development for colour measurement is the recording photometer; the varying types of consistency required for various printing processes can be differentiated by the empirical flow test; drying by oxidation is fairly well understood, but there is less information on absorption drying and evaporation. Recent developments are the heat-set inks; the drying of inks by precipitation; and the use of colloidal media for making quick-setting inks. Mr. Fishenden: The necessity for more cooperation between the industries is emphasized. The printing surface is of especial importance in printing halftones, and in colour printing too little attention is being paid to the reduction of overprinting. Discussion: The process of absorption drying is suggested to be a simple filtration and a penetration of the medium into the absorbent paper leaving a concentrated suspension of pigment in medium on the surface of the paper; the process is limited by surface tension forces. Optical methods have been tried for measuring penetration of ink into paper. The formation of ink spray may be due to surface tension phenomena at the air-ink interface. The aerosol produced comprises equal numbers of positively and negatively charged particles, the charges arising from friction of the rollers. The main cause of spraying is film thickness: if this exceeds a certain

maximum, dependent on the medium used, then excess is flung off, probably by centrifugal forces. *Paint Technology*. 17, No. 193, January, 1952, Page 25. *Paint, Oil and Colour Journal* is published by Scott, Greenwood and Son, Ltd., 8 Ludgate Broadway, London, E. C. 4, England.

CHARACTERISTICS OF OFFSET INKS. Charles F. King. *Inland Printer* 127, No. 4, July, 1951, Pages 62-63 and 75-76 (4 pages). Offset inks are different from letterpress inks because they must react with the fountain solution and also affect the plate so as to maintain printing and non-printing areas in their original relationship. The importance of pigment wettability, extender properties, greasiness of ink, ink tack, and form being printed are discussed. The difference in shade obtained between letterpress and offset is due to the use of a rubber blanket, not a difference in ink transferred.

THE NATURE OF TACK. Andries Voet and Claude F. Geffken. *Industrial and Engineering Chemistry* 43, No. 7, July, 1951, Pages 1614-24 (11 pages). A study of the dynamics of tackiness of liquids in general and of printing inks in particular is reported. It was found that rapid film separation does not occur by liquid flow as previously thought, but is the result of a viscoelastic response of the liquid which may react (in varying degrees) as a solid toward rapidly applied stresses. Tack in liquid films is related to a response to stress mechanism found in long-chain molecules, characterized by a modulus of 10^6 to 10^8 dynes/sq. cm., and a relaxation time of the order of 10-4 second. Tack energy is the total energy necessary to cause film separations. Experiments with printing inks show the existence of a linear relationship between tack energy and film thickness which gives a value for the tack energy per unit volume referred to as tack energy density. A logarithmic plot of tack energy density against viscosity and against the reciprocal absolute temperature is a straight line. Tack energy density is also proportional to the peripheral cylinder speed, but is independent of the pressure. This work results in a physical basis for a newer conception of tackiness and in certain theoretical predictions of ink behavior on a press. 5 tables, 9 figures, and 33 references. *Bulletin of the Institute of Paper Chemistry* 21, No. 12, August, 1951, Page 868.

PRINTING INK AND EQUIPMENT DEVELOPMENT AND THEIR EFFECT ON PAPER REQUIREMENTS. L. F. Engelhart. *Technical Association of the Pulp and Paper Industry* 34, No. 8, Pages 116-19A (August, 1951). The author discusses satisfactory printability, the paper properties which govern it, ink structure in relation to drying, heat-set inks and moisture-set inks and their specific requirements of paper, and requirements for other quick-set inks. 3 references. *Bulletin of the Institute of Paper Chemistry* 22, No. 1, Sept., 1951, Page 40.

FIRST PRINTING INK SYMPOSIUM YIELDS ACTIVE DISCUSSION. Division of Paint, Varnish and Plastics Chemistry. *Chemical and Engineering News* 29, No. 38, September 17, 1951, Pages 3834-3836 (3 pages). The problem of color control and rheology of printing inks were discussed by Granville and Lower. The limitation and value of instruments for measurement and control of the above properties were described along with factors influencing measurement.

TRAPPING OF INKS ON MULTICOLOR PRESSES. Theodore Makarius. *Modern Lithography* 20, No. 1, January, 1952, Page 39. A discussion of some of the fundamentals of trapping of inks on multicolor presses, among which are the tack of the inks, pressures, sequence of colors, and ink film thickness.

* PRINTING INKS. C. C. Mill. *Chemistry and Industry* 8, February 23, 1952, Pages 156-9. The author discusses the application and rheology of printing inks, the interpretation of rheological data,

and the use of rheological measurements for predicting ink performance. Other factors which are concerned in the use of printing inks (e.g., surface tension) are mentioned briefly. 4 figures and 12 references. *Bulletin of the Institute of Paper Chemistry* 22, No. 8, April, 1952, Page 601. Chemistry and Industry is published by Society of Chemical Industry, 56, Victoria Street, London, S. W. 1., England.

* PRINTING INK VEHICLES UNDER THE MICROSCOPE. Chr. Hostmann-Steinberg'sche Farbenfabriken. *Allg. Papier-Rundschau* No. 4, February 25, 1952, Pages 154-5 (in German). The selection of the proper vehicle for a printing ink will vary according to the furnish, beating, and sizing of the paper with which it will be employed. A simple method for predicting the tack of a vehicle is presented. When a drop of an ink varnish is brought between two glass plates, which are then separated rapidly, characteristic structures are formed, depending upon the viscosity of the oil, and which will give an indication of the pull exerted on the paper surface. Three photomicrographs of different varnishes are presented. A watery linseed oil produces a rather flat, compact structure mostly in the center of the circle and with wide arms; a weak linseed-oil vehicle (short inks) produces a much more pronounced structure distributed over the entire circle although the arms in the center are thicker than near the edges; a strong linseed-oil varnish produces a uniform pattern over the entire circle, which gives a good illustration of the stresses the paper is expected to withstand with long, tacky inks. Probably no paper would resist the tack of this third varnish without tearing. In practice, the varnishes of ink formulations are made in a range of different viscosities, so that their tack may be adjusted to the characteristics of the different paper surfaces. 6 figures. *Bulletin of the Institute of Paper Chemistry* 22, No. 8, April, 1952, Pages 600-1. Allgemeine Papier-Rundschau is published at Furstenbergstrasse 175, Frankfurt, a.M. 4, Germany.

LINSEED VS. SYNTHETIC (LITHOGRAPHIC VARNISHES). Gregory J. Huelsman, *National Lithographer* 59, No. 2, February, 1952, Pages 28-30 (3 pages). The advantages of synthetic vehicles as compared with linseed varnishes are discussed. Gloss inks have been made possible with resins. Maleic ester resins, phthalic alkyd resins, and alkyd vehicles have improved fast hard drying offset inks, pigment dispersion, printing, lay, sharpness of print, and outdoor life; they also have decreased water absorption for offset. Quicksetting inks, which set by preferential absorption of solvent from a pseudogell structure, are said to give less water emulsification in the ink, faster drying, and sharper printing.

THE RHEOLOGY OF PRINTING INK II: STUDIES OF SIMPLE DISPERSIONS. A. C. Zettlemoyer and G. W. Lower. *Division of Paint, Varnish and Plastics Chemistry* (Papers presented at Milwaukee meeting), March-April, 1952, Pages 206-19 (4 pages). A system composed of calcium carbonate and polybutene was used to investigate the effect of pigment surface area, particle size distribution, and surface active agent on viscosity. Viscosity increases with pigment surface area probably due to vehicle adsorption and the corresponding increase in volume occupied. Particle size distribution from 0.1 to 0.4 microns has no effect on viscosity. The lower the surface area of the pigment, the greater the concentration necessary to exhibit thixotropy.

* FINISHING VARNISH FOR APPLICATION OVER LITHOGRAPHIC INK. *U. S. Patent 2,597,863.* Paul W. Greubel. *Official Gazette* 658, No. 4, May 27, 1952, Pages 999-1000. 1. A finishing varnish for application over wet lithographic ink, said finishing varnish comprising in combination, an organic solvent soluble alkyd resin as a film forming ingredient, 2 to 13 per cent by weight based on the finished varnish of an oil immiscible-water soluble polar liquid

consisting of lactic acid as an ink pigment flocculant, and a volatile organic solvent for said resin, said volatile solvent being miscible with the ink vehicle and containing sufficient coupling agent selected from the group consisting of unsubstituted monohydric alkanols having from 4 to 8 carbon atoms and glycol monoethers in which the glycol portion of the molecule has from 2 to 4 carbon atoms and one free hydroxyl group and the other hydroxyl group etherified with an aliphatic hydrocarbon chain having 2 to 4 carbon atoms to maintain the ingredients in a single liquid phase.

INK TROUBLES

LIVERING (Leaves from a Formulator's Notebook). *Paint, Oil and Chemical Review* 114. No. 19, September 13, 1951, Pages 17-18 (2 pages). Possible causes for livering are discussed. The mechanism may be the change from the sol form to the gel form of the dispersed phase in the varnish through the influence of the pigments, driers, etc., in the ink. It may be caused by soap formation between pigment and vehicle making the type of acidity an important factor. It may also be caused by physical forces at the surfaces of pigment particles. Formulating to discourage livering may involve addition of materials to weaken bonds or coating pigment particles to prevent the flocculation of the vehicle around pigment particles and/or to prevent soap formation.

NATURE AND CAUSE OF GREASING IN LITHOGRAPHIC PRINTING. *Canadian Printer and Publisher* 61, 3, March, 1952, Page 49. Twenty factors influencing greasing are listed. They include both press conditions and ink faults.

PIGMENT DEFICIENCIES. A. C. Zettlemoyer. *American Ink Maker* 30, 4, April, 1952, Pages 27-9, 63 and 65 (5 pages). The author discusses ways in which printing ink pigments could be improved. Pigment properties discussed are color, bronzing characteristic, grinding characteristics, strength, permanence, abrasiveness, tendency to grease litho plates, influence on drier (loss in drying on aging), sensitivity to heat, and rubproofness of finished work.

INK PROBLEMS SOLVED BY RESEARCH. Joseph Curado. *Printing Equipment Engineer* 82, No. 9, June, 1952, Pages 73-4 (2 pages). Developments in ink setting are discussed. Cold-set inks failed because of mechanical problems of maintaining presses at high temperatures. Heat-set inks are widely used in printing publications, but the ovens and inks required cost too much for use on daily newspapers. Steam-set inks are used in the packaging field. They are limited in speed by the diffusion rate. Other methods of accelerating drying rates are ultraviolet light, supersonic vibrations, and ultra high frequency radio waves. None have shown too much promise. Diffusion rates limit the value of using sulfur chloride.

INK TESTING

*PIGMENT DYESTUFFS AND LITHO INKS — THE SIGNIFICANCE OF pH MEASUREMENTS. J. Keaton. *Paint Technology* 16, No. 187, July, 1951, Page 289. In examining pigment and vehicle components of pigment-oil systems, routine tests are first made for those properties common to most pigment-oil systems, e.g., oil absorption, viscosity; then special properties related to the use of the finished product are investigated; and finally the finished product is evaluated under conditions as closely related to commercial application as possible. Some defects may not be shown by any of these tests, e.g., the "breakthrough" by water of an offset litho ink during printing, caused by the gradual absorption of the fountain solution by the ink, followed by emulsification and the eventual breaking back of the water through the ink onto the distribution rollers, necessitating stoppage of the machine and cleaning. In investigating an offset litho ink that gave

occasional severe emulsification, all the ingredients appeared normal under conventional tests. As trouble had arisen with a new pigment batch, the pH of water extracts was tested; the new batch gave pH 9.6, while earlier satisfactory batches gave pH 6.6-6.8. For this test, 2.5 gm. pigment were dispersed in 100 ml. cold distilled water, heated to boiling in 1 min., boiled for exactly 5 minutes, cooled to 20° C., and filtered, and the pH of the filtrate taken on a pH meter. Readings of extracts of various pigments showed consistency in batches of the same pigment, but wide variation, 3.0-9.2, between different pigments. Comparative practical tests confirmed that pigments with high pH extract, viz., 9.2, were more prone to emulsification than those with lower pH extract, viz., 3.9. One ink, "Blue KR", pH extract 9.2, livered too badly for use. By treating this with dilute benzoic acid, and reducing the pH to 3.3, no livering occurred. This improvement was confirmed by washing the pigment successively with dilute acetic acid and water. Paint Technology, 5 Grange Court, Pinner, Middlesex, England.

* THE TESTING OF PRINTING INKS. William C. Walker. Paper presented at the American Chemical Society Paint, Varnish and Plastics Division Diamond Jubilee meeting. *Paint, Oil and Chemical Review* 114, No. 17, August 16, 1951, Page 12. Printing ink is definitely one of the most important materials employed by the printing and publishing industry. The properties of the ink control to a great extent the appearance of the finished job, the ease and speed of its production, and its durability during its useful period. It is very important, therefore, that the properties of printing inks be well known and very carefully controlled. Setting up test methods for this material is a very difficult matter, however, because of the very complex and variable conditions under which it is expected to perform. This problem and the lack of highly scientific standards in the printing industry have retarded the development of test methods in this field. There are two types of approaches to the establishment of standard test methods in such a field. The detailed approach involves the setting up of methods for specific cases that cover local problems with little, if any general application. A great deal of work has been done along these lines by the practical men doing the printing. The general approach seeks through the measurement of relatively general properties to produce tests that will be useful in a wide variety of situations. This approach offers the most promise for the future and is thus the one in which we are most interested. Characterization of printing inks by chemical analysis is seldom very helpful, and emphasis must be placed on the physical properties which control particular steps in the performance of the inks. There are also some general performance tests that can be applied and developed. As a result of this picture several tests are being vigorously developed at the present time. The most important are fineness of grind, drying time, rub resistance, viscosity, and tack.

* A LABORATORY METHOD FOR STUDYING SOME INK-PAPER RELATIONSHIPS. W. J. Beckman, G. N. Matson, G. R. Sears and J. O. Thompson. Paper presented at the American Chemical Society Paint, Varnish and Plastics Division Diamond Jubilee meeting. *Paint, Oil and Chemical Review* 114, No. 17, August 16, 1951, Page 12. A new experimental approach to the study of the ink receptivity of paper in the printing process is described. The method involves the nip-spreading of a drop of ink over the paper surface under test by means of a smooth cylinder rolling down an inclined plane. An analysis of the elliptically shaped ink patterns obtained under a variety of experimental conditions and with a variety of printing surfaces has been made. The results show that the spreading characteristics are influenced by surface roughness, absorptivity of the surface, speed of spreading, viscosity of the ink, and nip pressure. This method has not yet been

developed to the point where a direct correlation between the ink receptivity of papers and the spread patterns obtained with these papers can be made. Extension of the study along indicated lines, however, offers considerable promise.

INKOMETER MEASURES LENGTH AND TACK OF INKS. Charles F. King. *Inland Printer* 127, No. 6, September, 1951, Page 66. When sensitization of the plate occurs due to transfer of ink of previous color from paper to blanket to plate, increasing the setting speed of the ink does not cure the problem. Piling of ink will occur when it is insufficiently ground. Anomalies have been obtained in ink trapping when using the Inkometer to test tack. Unlike previously published data, the author's experimental evidence indicates that ink tack increases with volume carried. Introduction of the water factor would improve Inkometer value.

NPIRI DIRECT-READING ATTACHMENT (for Present Users of the Inkometer) A. C. Zettlemoyer and W. C. Walker. *American Ink Maker* 29, No. 10, October, 1951, Pages 59 and 111-112 (3 pages). The use of a standard, stable, inert metering roller has improved reproducibility. The direct reading attachment speeds up and simplifies operation. It consists of a stabilized power supply, electrical strain gauge, and a microammeter.

THE PENETRATION OF VISCOUS OILS INTO POROUS PAPERS. L. Pihl and I. Olsson. *Grafiska Forskningslaboratoriet, Meddelande* 28, February, 1952, Pages 58-72 (15 pages). (Author abstract in English, article in Swedish). The height of rise and the oil floatation number for viscous oils on newsprint and filter-paper have been studied. It was found that the formula deduced by Lucas-Washburn for the height of rise of low-viscous fluids can be applied in both cases.

THE ANALYSIS OF ORGANIC PIGMENTS. K. G. Hargreaves. *Journal of the Oil and Colour Chemists' Association* 35, 382, April, 1952, Pages 139-161 (23 pages). The identification of organic pigments by chemical means is considered. Pigments are classified into four main groups—azo pigmentary colours, lakes and toners of acid dyestuffs, lakes of basic dyestuffs, vat and other products and their differentiation described. Only azo colours readily lend themselves to chemical analysis; the method of reduction and identification of the constituent components is discussed for azo pigmentary colours, and azo lakes and toners; the more recent methods of dry distillation with soda lime and sodium dihydrogen phosphate are shown to possess certain advantages. The determination of the nature of any substratum or laking metal is described and tables are given displaying spot tests for rapid identification of the colours most frequently used in commerce. A brief indication is given of methods useful for dealing with mixtures of pigments.

NPIRI PLANETARY RUBOMETER. W. C. Walker and A. C. Zettlemoyer. *American Ink Maker* 30, No. 6, June, 1952, Pages 59-61 and 113 (4 pages). The purpose of rub testing, the action it should simulate, desirable features of a rubometer, and how the NPIRI planetary rubometer fulfills these are discussed. The operation of the instrument, evaluation of the results, and precautions to observe when using it are also covered.

PICK TESTING OF OFFSET PAPERS. Gordon C. Wheeler and Robert F. Reed. *TAPPI* 35, No. 6, June, 1952, Pages 272-6 (5 pages). The printing impression and the factors that contribute to picking of paper during printing are discussed. The press conditions that should be simulated in a pick test are printing surface, ink-film thickness, pressure, period of contact, and rate of separation of printing surface and paper. A simple pick tester has been constructed that approximately meets these condi-

tions. It consists of an unbalanced flywheel that acts as a pendulum, causing a springloaded, inked hammer to strike the paper sample. A series of eight tack-tested inks is used, and the pressure, period of contact, and rate of separation are adjusted to give the same results as an offset press at normal printing speed.

INK DRYING

* OILS AND SYNTHETIC RESINS AS HIGH-STRENGTH DRIERS. Roland Lipsky. *Bull. soc. chim.* France, 1951, Pages 142-3. The acid chlorides of eleostearic (I) and 4-cetoeleostearic acids dry very rapidly in the absence of ordinary driers. These synthetic oils are suggested as driers in the usual sense. Thus, the addition of 20-25% of I to castor oil (2% oleic acid) and heating for one hour at 190° produced an oil with 10% oleic acid which dried without drier in 20 hours. The reaction product between aniline and I is suggested as a synthetic thermoplastic resin. *Chemical Abstracts* 45, No. 14, July 25, 1951, Column 6396. American Chemical Society, 1155, 16th Street, N. W., Washington 6, D. C.

* DRYING INHIBITORS. *Patra News* No. 7, 1951, Page 3-4. Many salts and acids used in the fountain solutions of lithographic printing presses prevent or slow down the drying of lithographic varnishes. The solutions which inhibit the drying of litho varnishes will also inhibit the drying of inks made from those varnishes. Salts and acids having a considerable inhibiting effect on drying are as follows: phosphoric acid, ammonium phosphates and sodium phosphates; sulfuric acid, ammonium sulfate and bisulfate, sodium bisulfate; citric acid, ammonium citrate and sodium citrate;and tannic acid.The following had slight or no effect on drying: nitric acid and ammonium nitrate; chromic acid, ammonium dichlorate and ammonium chromate; hydrochloric acid and ammonium chloride; gum arabic; and sodium carboxy methyl cellulose. *American Ink Maker* 29, No. 7, August, 1951, Page 41.

NEW IDEAS ON THE DRYING OF PRINTING INKS. W. Dotzel. *Der Polygraph* 4, No. 21, November 5, 1951, Pages 710-1 (in German). The subject is briefly discussed under (1) oxidation and polymerization of the binder; (2) the setting of the binder; (3) penetration into the paper surface; (4) evaporation of the solvent; (5) heat drying inks; (6) inks which dry by the action of chemicals; and (7) the acceleration of the drying of inks by ultraviolet rays.

DRIERS FOR PRINTING INKS. G. G. Unkefer and John Dickenson. *American Ink Maker* 28, No. 10, 1950, Pages 57-9, 61, 63, 65, 67, and 101 (8 pages). A review of drier development, mechanism, effect of driers, function of drying metals, prepn. of driers, types of driers, factors affecting performance, drier absorption, drier technology, and future trends. 16 references. *Chemical Abstracts* 45, No. 22, November 25, 1951, Col. 10609.

* NATURALLY QUICK DRYING PRINTING INKS AND PAPER. Werner Unteutsch. *Allg. Papier-Rundschau* No. 24: 1037 (December 31, 1951) (in German). Reference is made to quick-drying printing inks which do not depend on the addition of metal driers but which are so formulated that the inks gel on contact with the paper surface, whereas they remain fresh and without skin formation in the fountain, even on longer standing. These inks should not be used in connection with parchment, glassine, cellophane, or foil papers; in the case of very hard-sized or highly calendered papers, the gelling process will be retarded. However, they are suitable for a large number of papers and boards, particularly coated and chromo papers. Several colors may be applied in succession, even at intervals of several days or weeks. Special reference is made to the German "Prestoprint" inks of Gebr. Hartmann, the color intensity of which is claimed to surpass that of American products hitherto considered superior in every respect. It is self-evident that for best

results the correct understanding and co-operation of the printer is also required in their use. *Bulletin of the Institute of Paper Chemistry* 22, No. 7, March, 1952, Page 519. *Allgemeine Papier-Rundschau* is published at Furstenbergstrasse 175, Frankfurt a. M. 4, Germany.

* HOW PRINTING INKS DRY. Coates Brothers, Ltd. *British Printer* 64, No. 382: 42-4 (January-February, 1952). Following a discussion of the three fundamental types of ink drying, chemical action, evaporation, and absorption, the following improved methods of drying are described: quick-setting, heat-drying, precipitation, polymerization, cold-setting and electrical methods. 1 illustration. *Bulletin of the Institute of Paper Chemistry* 22, No. 6, February, 1952, Page 431. *British Printer* is published at 2, 3, and 4 Cockspur Street, London, S. W. 1, England.

SOME INVESTIGATIONS OF THE DRYING OF LITHOGRAPHIC INKS. Alf Andersson and L. Pihl. *Grafiska Forskningslaboratoriet, Meddelande.* 28, February, 1952, Pages 3-15 (13 pages) (Author abstract in English, article in Swedish). Samples of ink were taken from the ink duct and the plate rollers in some offset presses. The samples taken from the rollers contained between 24-32% water and the drying time was considerably much longer than for the ink taken from the duct. The effect of the negative ions of the fountain solution on the drying time was investigated, and it was found that phosphate, citrate, oxalate and sulphate ions had a pronounced unfavourable effect on the drying time while chromate and nitrate ions had very little or no influence. It was found that hydrolyzation of the driers through the action of the fountain solution takes place. Experiments with various driers resulted in the invention of a new type of drier containing calcium perborate which had an extraordinarily strong effect on inks emulsificated with fountain solutions.

A NOTE ON "SPOTTY" INK DRYING. R. R. Coupe. *Journal of the Oil and Colour Chemists' Association* 35, No. 381, March, 1952, Pages 118-23 (6 pages). An experimental survey has been made of the fairly common ink drying defect known as "spotty" drying. Contrary to a frequently expressed opinion, it has been shown that the defect is not caused by variations in the paper or board but is a feature of the ink itself. The phenomenon is not restricted to a particular type of drier or pigment and has on occasions been observed with lithographic varnishes. Some results depicting the influence of a dried ink film on the drying of a super-imposed ink are presented.

INK DRYING—FAST OR SLOW. Theodore Makarius. *Modern Lithography* 20, No. 5, May, 1952, Pages 57 and 143 (2 pages). Before starting a job, some of the ink should be tapped out on the stock to be used. Ink film thickness is extremely important on bulky offset paper to prevent offsetting in the folding and binding operations and on coated and hard surfaced papers for the same reasons. Drier should be adjusted to give good surface drying, to avoid crystallization in multicolor work, and to avoid chalking.

LITHOGRAPHY — GENERAL

*POLYVINYL ALCOHOL. N. Platzer. *Modern Plastics* 28: 95-8, 161-62, 169, No. 7, March, 1951. A review is given of the technical properties and of the method of handling polyvinyl alcohol; the methods of plasticization, tanning, and many practical applications are discussed. *Monthly Abstract Bulletin* 37, No. 11, November, 1951, Page 625. *Modern Plastics* is published by Modern Plastics, Inc., 575 Madison Avenue, New York 22, New York.

THE FUTURE OF LITHOGRAPHY FOR SECURITY PRINTING. Claes Aller. *British and Colonial Printer* 149, No. 1182, July 27, 1951, Page 108. The author describes the value, traditional characteristics, methods, and growing demand for security printing. He points out the defects in established offset for this kind of production (deterioration of plate from wear and the limit to the fineness of lines obtainable because of the grain used). The lack of grain and long life of bimetallic plates overcomes these defects.

LITHOGRAPHIC PLANT LAYOUT. Charles W. Latham. *American Printer* 132, No. 7, July, 1951, Pages 42-43, 60, 62, and 64 (5 pages). The author discusses the importance of flow of work, tonnage of material to be moved, building compactness, employee travel, and engineering aspects in making a plant layout. The platemaking department is used as an example and such questions as location of department, numbers of the various pieces of equipment, feasible number of platemaking rooms, organization of work when more than one man is used in the plate room, number and arrangement of work stations, decorating, and operations to be performed are covered.

AIR CONDITIONING FOR LITHOGRAPHY. Leo Walter. *Tin-Printer and Box Maker* 27, No. 319, August, 1951, Pages 5-6 (2 pages). The four essential operations of air conditioning include cleaning, temperature control, humidity control, and distribution. Air conditioning may increase production and increase employee comfort. Automatic control is superior to manual control.

*PRESSURE SENSITIVE DECALCOMANIA AND METHOD OF MAKING THE SAME. *U. S. Patent 2,567,067.* Alfred F. Grupp, Harry C. Rathke, Elwood S. Talan, and Elmore Watts. *Official Gazette* 650, No. 1, September 4, 1951, Page 275. 5. A method of forming a pressure sensitive decalcomania having a water permeable backing with a water soluble film thereon which comprises applying over said film a solution comprising a thermoplastic resin in a volatile solvent, permitting said solution to dry to form a normally nontacky and non-pressure sensitive resinous layer, applying directly thereover a transfer design film, permitting the latter film to dry, subsequently applying directly over the design film a lacquer containing a sufficient quantity of a readily migratable plasticizer to render said resinous layer tacky and pressure sensitive, and allowing said plasticizer to migrate through said transfer design film to said resinous layer and thereby convert the latter to a tacky pressure sensitive condition.

TRANSPARENT PROOFS FROM TYPE FORMS. Morris S. Kantrowitz, Arthur A. Dillon, and Earl J. Gosnell. *Modern Lithography* 19, No. 10, October, 1951, Pages 47-48, 55, 57, 111, and 113 (6 pages). This is the first article of a condensation of a 24-page booklet (of the same title) available from the Supt. of Documents. Listed are definition, trade practices, powdering or dusting, opacity of the image, thickness of sheeting, compression of offset blanket, and new printing ink.

AIR CONDITIONING FOR LITHOGRAPHY—3. CENTRAL AIR CONDITIONING PLANTS. Leo Walter. *Tin-Printer and Box Maker* 27, No. 321, October, 1951, Pages 7-8 (2 pages). The layout of an air conditioning plant and the functions of the various pieces of equipment are described. Reduction in installation costs can be obtained by conditioning only part of the total air circulated and by calculating the plant for average loads instead of peak loads. Automatic control is preferred. Dew-point and wet and dry bulb control methods are described.

TRANSPARENT PROOFS FROM TYPE FORMS — Part Two. Morris S. Kantrowitz, Arthur A. Dillon and Earl J. Gosnell. *Modern Lithography* 19, No. 11, November, 1951, Pages 40-2, 117, 119 and 121 (6 pages). In this second part are described type forms or line plates, care of rollers, drying of ink, cleaning type, washing blanket, eliminating dust, humidity and temperature, size of sheet, bearer rules, condition of type, locking the form, burnishing the type, inking the press, and makeready. Complete 24 page booklet "Transparent Proofs from Type Forms" obtainable from Supt. of Documents, U. S. Govt. Prtg. Office, Washington 25, D.C., for 30 cents.

CONVERTING LETTERPRESS PHOTOENGRAVINGS TO OFFSET. Charles F. King. *Inland Printer* 128, No. 2, November, 1951, Pages 62-3, 90 and 92 (4 pages). Some lithographers are having photoengravings made for both black-and-white work and for color work and then working from either reproduction-proofs or transparencies pulled from these engravings. The author discusses the characteristics of this method of working and points out that it should be economical to attain the same results through conventional lithographic operations. Some of the precautions for the lithographic method are given.

TRANSPARENT PROOFS FROM TYPE FORMS. 3. Morris S. Kantrowitz, Arthur A. Dillon, and Earl J. Gosnell. *Modern Lithography* 19, No. 12, December, 1951, Pages 31-3 and 101 (4 pages). This is the third and concluding article on transparent proofs. The following topics are covered: inspection of proofs, inspection of equipment, retouching, cleaning transparent proofs, transparent proofs in production plan, overprinting to register, and design plan. (The complete bulletin is available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for thirty cents.)

OFFSET ALUMINUM "DECALS". Ray Bloomberg. *Modern Lithography* 20, No. 1, January, 1952, Pages 51 and 53 (2 pages). A description of the process used by the Boeing Airplane Company to prepare aluminum "decals" by the offset process. Tradenamed "Metal-Cal", they are made by first treating 0.003" aluminum foil by chemical means to create a color retentive coating on the surface and then applying the printing by Multilith offset process.

CONTROLLING THE PROCESS. A. P. Reynolds. *Modern Lithography* 20, No. 1, January, 1952, Pages 34-7 and 105 (5 pages). Cf. "Seven Major Control Points", *Graphic Arts Monthly* 24, No. 2, February, 1952, Pages 68, 70, 72, 74, 76, 78, 80, 102 and 104 (9 pages) and *Share Your Knowledge Review* 33, No. 1, October, 1951, Pages 13-18 and 23 (7 pages). The author chooses seven major control points in lithography and discusses some of the variables and characteristics of each. The seven control points are (1) graining, (2) the camera, (3) platemaking, (4) the press, (5) the ink, (6) the paper, and (7) the attitude of the personnel.

HOW GOOD IS DRY OFFSET? Wilson B. Fiske. *Printing Magazine* 76, No. 1, January, 1952, Pages 82-3 (2 pages).

A review of Graphic Arts Corporation of Ohio's experiences in preparing dry offset plates. Discussed are experiments with magnesium plates and some of the problems yet to be solved.

MAINTENANCE OF ELECTRIC MOTORS. *Tin-Printer and Box Maker* 28, No. 325, February, 1952, Page 14. This article emphasizes the need for occasional maintenance and points out the advantages of routine checking of the ampere loading.

* HARDER ALUMINUM FINISHES. *Alcoa Aluminum News-Letter*, March, 1952, Page 2. (Reprinted here in its entirety.) Superior hard coatings for aluminum, developed for applications where long-wearing surfaces coupled with light weight are essential, are now being released to licensees by Alcoa. The new anodic oxide coatings have been used extensively in aircraft and for orthopedic equipment. Intrinsically hard, aluminum oxide coatings cannot be chipped or flaked from their parent metal, and these newer types afford superior resistance to abrasive action and erosion. Alcoa has also acquired the U. S. patent rights to the Martin Hard Coating for aluminum, developed by The Glenn L. Martin Company of Baltimore. Similar in appearance to the Alumilite coatings, the MHC finish is also similar in hardness and structure. It has been used successfully by Martin on gears and pinions, turbine impeller blades, nozzles and on leading edges of high-speed airfoils. Its extreme hardness has permitted many aluminum-for-steel substitutions, resulting in sharp reductions of weight and operating costs.

* PRINTING - MACHINES. *British Patent 621,996.* Meyercord Company. *Abridgement of Specifications* XVI, B, Page 18. An apparatus for effecting rapid hardening or drying of printed or like deposits on webs or sheets is constructed to subject the printed or coated material to the action of the vapours of sulphur di-chloride or other hardening vapour without affecting the unprinted side of the material deleteriously, and is especially applicable to the printing of transfers. In Fig. 3, printed sheets 11 are carried by grippers 36 of a drum 25 through a chamber C^1 supplied with vapour of sulphur di-chloride from a vapour generator 53, the chamber C^1 being surrounded by a chamber C fitted with an exhaust pipe 50 which draws off any vapour escaping from the chamber C^1 at the entrance aperture 48 for the sheet, or at the exit 49. Air is drawn through openings 44, 45 formed between the lower edges 42, 43 of the outer housing 41 of chamber C and the surface of the drum 25, and the opening 45 is formed at the bottom of an elongated passageway 45*a* to enable any vapour clinging to the treated sheet to be drawn off before the sheet passes to the delivery band 38. The unprinted sides of the sheets 11 are not affected by the vapours as they cling to the drum 25 and so are not spoilt by the vapours. In Fig. 4, one unit of a multi-colour rotary press is shown in which the web passing from one printing-couple 64, 65 is led over a curved surface 84 of a treating chamber 73 and is guided by rolls 86, 87 and is then passed to further printing-couples and treating chambers. The chambers are similar in construction to that for treating sheets, and the vapours are supplied by a pipe 75 common to all the treating-chambers, and a suction manifold 78 serves for the outer chambers 96 which withdraw escaping vapours. Patent Office, 25 Southampton Buildings, London, W. C. 2, England.

MODERN TRENDS IN LITHOGRAPHY. Paul J. Hartsuch. *Printing Equipment Engineer* 81, No. 12, September, 1951, Pages 60-2 (3 pages). Among the recent developments in lithography, the author mentions the use of a high wet-strength paper wrapper for the damper rollers. It is removed and replaced when it becomes dirty, and eliminates the problem of cleaning the rollers. Also discusses masking, colored fluorescent lamps for making color separations, motor-driven arc lamps, a new method of making improved halftones with the

Kodak Magenta Contact Screen, color scanners, pre-Cronak, post-Cronak, post-Brunak, cellulose gum, soybean protein, Sensitivity Guide, vapor blasting for graining, use of metals besides zinc and aluminum for plates, multimetal plates, presensitized plates, blanket thickness gauge, and press, paper and ink improvements.

* INDUSTRIAL pH METER. *Chemical and Engineering News* 29, No. 43, October 22, 1951, Page 4542. A portable, direct-reading pH meter for plant use has been designed by Cambridge Instrument Company, Inc. It operates from a 110 v. a.c. outlet and requires no batteries. The electrode assembly is mounted on a door at the side of the instrument so that it is ready for use when the door is opened. A recess in the electrode compartment holds the bottles of buffer and potassium chloride solution supplied with the meter. The direct-reading scale, set at an angle on top of the instrument is graduated in 0.2 pH divisions from 0 to 14 pH. Readings can be interpolated to 0.05 pH and the over-all accuracy is said to be 0.1 pH. Automatic temperature compensation is provided over the range from 2° to 100°C. with a resistance thermometer. Information on this item (E-5) can be secured from Readers' Information Service, Chem. and Engrg. News, 332 W. 42nd St., New York 18, N. Y.

DETERMINATION OF SODIUM CARBOXYMETHYLCELLULOSE IN DETERGENT MIXTURES BY THE ANTHRONE METHOD. Henry C. Black, Jr. *Analytical Chemistry* 23, No. 12, December, 1951, Pages 1792-5 (4 pages). A method was needed for determination of sodium carboxymethylcellulose in household detergents. The green color formed by reaction of anthrone with carbohydrate materials in sulfuric acid solution provided the basis for the present method. Color intensity is measured with a spectrophotometer. Controlled heating is necessary for reproducible results. Color intensity varies inversely with degree of substitution of the carboxymethylcellulose. The accuracy is 2% relative, provided the degree of substitution is known. Other carbohydrates, carbohydrate derivatives, furfural, 5-hydroxymethylfurfural, and certain polyoxyethylene derivatives of fatty acids and phenols are the only known interfering substances. The method should be useful for determination of carboxymethylcellulose in other mixtures and, with appropriate modification, of other carbohydrates and carbohydrate derivatives.

PLATES AND GRAINING

COATING PROBLEMS IN METAL LITHOGRAPHY—Part Two (Concl.). Charles R. Bragdon. *Modern Lithography* 19, No. 7, July, 1951, Pages 61, 63 and 65 (3 pages). Ink characteristics necessary in metal lithography are fast drying rate, freedom from discoloration, loss of adhesion and toughness, and case-hardening. The inks must level out quickly, contain non-toxic, non-explosive solvents, be free of roughness, have unusually high hiding power, and be nontoxic and free of taste or odor when used for food can lining. Specialized applications of the industry include finishing venetian blinds, collapsible tubes, and lining metal cans to resist solvents and corrosive chemicals.

* GRAINING MACHINE FOR ZINC OFFSET PRINTING PLATES. *U. S. Patent 2,576,088.* Walter F. Horst. *Official Gazette* 652, No. 4, November 27, 1951, Page 967. 1. A freely suspended and free-swinging graining box, and means entirely carried by the box to gyrate the same, said means comprising an eccentrically weighted rotational member and a drive for the latter.

* TREATING LITHOGRAPHIC PLATES. *U. S. Patent 2,589,313.* William H. Wood. *Official Gazette* 656, No. 3, March 18, 1952, Page 680. 1. In the treatment of lithographic printing plates, applying to the image bearing metal plate a solution essentially of a polysaccharid carboxyether.

* VACUUM PRINTING FRAME. *U.S. Patent 2,594,920.* Bernard R. Halpern. *Official Gazette* 657, No. 5, April 29, 1952, Page 1501. 1. A self-balancing, reversible vacuum printing frame comprising a base structure, reversible supporting bars pivoted intermediate their ends in opposed, spaced relation, at opposite ends of said base structure, companion glass and blanket frames adapted and arranged one to substantially counterbalance the other, substantially parallel links pivotally mounted intermediate their ends on the opposite ends of said supporting bars and said links pivotally connected at their opposite ends with the companion glass and blanket frames, respectively, and whereby said glass and blanket frames may be separated in counter-balancing relation by rotative movement of said links on their intermediate pivots on the ends of the supporting bars and said frames may be reversed to bring either the glass or the blanket frame to the top by rotation of said supporting bars on their intermediate pivots on the base structure.

PRESS CYLINDERS AND BLANKETS

HARD OR SOFT CYLINDER DRESSINGS? *Modern Lithographer and Offset Printer* 67, No. 9, September, 1951, Pages 170-171 (2 pages). The relative merits of hard and soft blanket packings are discussed. Soft packing results in easier adjustment, reduced ribbing, and less sensitivity when damaged or creased sheets pass through the press. Disadvantages are increased slur, creep, and misregister. Hard packing does not have the above disadvantages, but calls for more initial effort to insure an even lay of ink and is more sensitive to misfed sheets.

* WATER-REPELLENT INK-TRANSFER SURFACE. *U. S. Patent 2,562,782.* F. H. Frost. *Chemical Abstracts* 46, No. 4, February 25, 1952, Column 1672. A water-shedding offset blanket is described which is substituted for the water-wettable rubber blankets normally used in offset lithographic printing. This substitution reduces the absorption of water by and subsequent distortion of the printed sheet, allows simpler press operation, and the quality of the printing is improved as smaller quantities of dampening solution are required in each printing cycle. The water-shedding blanket may be any material which causes water to gather in droplets on its surface and which is ink-receptive as well as having other qualities normally requisite in an offset blanket. Suitable blankets may be prepared by applying a paraffin coating, or a water-shedding plasticized vinyl-resin lacquer, to a rubber offset blanket. Other suitable types include blankets prepared from a sheet of copolymer of 85% vinylidene chloride with 15% vinyl chloride and plasticized with 15% dibutyl sebacate, dibutyl phthalate, or diethyl phthalate, or blankets may be prepared from elastic resins, such as silicone rubber, both of which are ink-receptive and water-shedding.

TONE AND COLOR CONTROL

LITHOGRAPHIC DOT CONTOUR — Part One. I. M. Bernstein. *Modern Lithography* 19, No. 11, November, 1951, Pages 43-46 (4 pages). In part one, the author discusses generally the factors involved in lithographic dot contour in an effort to arrive at a better and more accurate understanding of the problem. Discussed and illustrated with photomicrographs are the effects of the paper stock on letterpress and lithographic halftones, and the dot structure on the "Lithure" plate in various steps of its processing.

COLORIMETRIC INVESTIGATIONS IN MULTICOLOR PRINTING. 1. J. A. C. Yule and R. Colt. *Modern Lithography* 20, No. 2, February, 1952, Pages 41-3 (3 pages). Communication No. 1424 from Kodak Research Laboratories. In the development of color correction methods for multicolor printing, it is important to have an understanding of

the relationship between the colors of the individual printing inks and their combination in the form of superimposed halftone dot patterns. Two sets of equations have been proposed. It is shown that both equations lead to rather similar results, but neither of them fit the observed facts perfectly, this being partly due to the optical characteristics of the paper. By suitable modifications, either set of equations may be made to correspond more closely to the actual behavior of the inks.

CONTROLLING TONE VALUES ON THE OFFSET PRESS. Charles F. King. *Inland Printer* 128, No. 6, March, 1952, Pages 49-51, 74 and 82 (5 pages). The author discusses several of the press factors which can influence or change the tone values printed from an offset plate. Among these are the type and condition of the paper, the size and design of the press, the press speed, the impression pressures, and the control of the water fountain.

PRESSES

* PRINTING MACHINES. *British Patent 632,388.* Harris-Seybold Company. *Abridgement of Specifications* XVI, Page 128. A printing press has three or more generally similar printing units A, B, C, D, in series, each unit comprising an impression cylinder 12 and a printing cylinder 10 above, and means such as transfer cylinders 26 are provided in the lower part of the press for transferring sheets from one impression cylinder to the next and arranged so that the operator can stand in a space 40 above said transfer cylinders and between the units, and the units are so disposed that the planes 34 comprising the axes of the printing and impression cylinders extend upward approximately vertically, the planes in adjacent units diverging upwardly in a fanned-out arrangement. All the cylinders 12 are of uniform size and the cylinders 26 are double said size. Each unit comprises also a blanket cylinder 11, whose axes intersect the apex of an isosceles triangle whose base lies in said plane. Sheets are fed from a feed-board 23 by a feeding cylinder 24 to grippers 20 of a cylinder 12 and from the last cylinder 12 to gripper bars 33 of a chain conveyor 31. British patents can be secured from the Patent Office, 25, Southampton Buildings, London, W. C. 2, England, for approximately 36 cents.

OPERATING A SMALL OFFSET PRESS—Part Three of a Series. Roy Barnes. *Harris Impressions* 11, No. 3, May-June, 1951, Pages 1-4 (4 pages). This article covers ink mixing, inker care and adjustment, and ink fountain adjustment. Correct ink mixing is important in preventing piling on rollers, scumming (end result is a blind plate), paper picking, chalking, and plugging. Inker care involves cleaning rollers to prevent roller streaks, scum, hickies, and covering failure. Correct setting of the rollers by means of strips of tissue is described. In setting the ink fountain, kinking the blade or scoring the roller should be avoided.

* METHOD OF CLEANING INK APPLYING MECHANISMS AND MATERIAL USED THEREIN. *U. S. Patent* 2,569,052. Harold R. Gullixson. *Official Gazette* 650, No. 4, September 25, 1951, Page 1095. 1. The method of cleaning an inking roller in a press, duplicating machine or the like, which comprises discontinuing the delivery of ink to the roller, mounting a sheet of substantial thickness of highly absorbent material in the machine in the position normally occupied by the element normally receiving ink from the roller, operating the press to bring the absorbent material repeatedly into ink receiving relation to the roller, until substantially all of the ink has been transferred to said sheet, and removing the sheet from the press.

DAMPENING IN LITHOGRAPHY. Charles W. Latham. *American Printer* 132, No. 8, August, 1951, Pages 28-9, 53-4 and 56 (5 pages). After a detailed description, the adjustment and operation of the dampening system is thoroughly covered.

PRESENTING ALL THE FINE POINTS ABOUT THE INKING SYSTEM OF THE OFFSET PRESS. Charles W. Latham. *American Printer* 132, No. 9, September, 1951, Pages 34-35, 58, 60, and 62 (5 pages). Evolution and operation of the modern inking system are described. The author covers setting and adjustment of the system, method of operation, and things to be careful about.

MAINTENANCE OF PRESSES. Carl O. Siebke. *National Lithographer* 58, No. 11, November 1951, Pages 28-9, 91-3 (5 pages). Maintenance of presses is described. When oiling: 1. provide correct amt. of oil; 2. clean off grease fittings before applying grease; 3. clean press thoroughly every six months; 4. keep gears clean and oiled; 5. check cam follower rollers frequently; 6. oil chains well; 7. clean up rust spots with "Crocus cloth". Feeder and inking unit maintenance is described. The inking unit should be thoroughly cleaned when changing colors. Check form rollers frequently. Water buckets, sponges, and water fountain should be cleaned at stated intervals. Maintenance of delivery and electrical units is also covered. Cleanliness is the first requisite.

pH CONTROL OF FOUNTAIN SOLUTIONS IMPORTANT TO PRESSWORK. Charles F. King. *Inland Printer* 128, No. 3, December, 1951, Pages 62-3, 82-3 (4 pages). The author describes a pressroom problem of short life deep-etch plates which he believes to be due primarily to the composition of the fountain solution rather than to its pH value. He points out that while LTF now recommends a sliding pH scale be used and that all jobs be run at the highest possible value, LTF does not lay enough emphasis on the formulations of the fountain solution being compared. Some shops control the fountain solution by varying the proportion in it rather than by pH.

FEEDING AND REGISTERING (Part 3 of a series). Roy Tyler and Roy Barnes. *Harris Impressions* 12, No. 1, January-February, 1952, Pages 1-4 (4 pages). This article covers the operation and adjustment of the feeding and registering devices on the Harris press. Choke, stop finger, trip pendulum and latch block, and fast sheet detector function and adjustment are described.

* WATER MOTION FOR OFFSET PRESSES. *U. S. Patent 2,580,667.* Harry W. Faeber, Orville Dutro and Lyle V. Dutro. *Official Gazette* 654, No. 1, January 1, 1952, Page 144. 1. Means for transferring liquid between a fountain roller and a distributor roller parallel thereto which comprises a rotatable shaft between and parallel to said fountain roller and distributor roller, a spider on said shaft, a plurality of liquid transfer means on said spider for alternate contact with the peripheries of the fountain roller and the distributor roller, and means to alternately accelerate and decelerate the speed of rotation of the shaft to vary the speed with which the transfer means revolve about the axis of said shaft.

* WATER CONTROL ROLLER FOR OFFSET PRESSES. *U. S. Patent 2,584,380.* Raymond C. Delaplane. *Official Gazette* 655, No. 1, February 5, 1952, Pages 116-17. 1. A water control roller for a lithograph press comprising a pair of block members; a shaft passing through both block members; means for preventing rotation of said members on said shaft; an arm extending forwardly from each of said block members; a leaf spring clamped between each block member and its arm and extending longitudinally of and below said arm; a cylindrical loop integrally formed in the extremity of each spring; a resilient roller rotatably journalled in said loops and extending between said springs; and means for urging said springs away from their adjacent arms.

DAMPENING WITHOUT ROLLERS IN OFFSET PRINTING. *Der Polygraph* 5, 7, April 5, 1952, Page 150 (in German). A brief description with illustration is given of a device to replace rollers for dampening the plate in offset printing proposed by Paragon Supply Company, Ltd., London, W. C. 2. It consists of mutiple spray nozzles arranged parallel to the plate cylinder. Each nozzle has individual controls for water and air.

OPERATING LARGE HARRIS PRESSES: FEEDING AND REGISTERING. Part 4. Roy Tyler and Roy Barnes. *Harris Impressions* 12, No. 2, March-April, 1952, Pages 1-4 (4 pages). The operation and adjustment of the side guides, feed rolls, sheet hold-downs, and overfeed mechanisms are described.

NEW PRESS WASH UP METHOD. *Modern Lithography* 20, 4, April, 1952, Pages 36-7, 111, 113 (4 pages). The "Knox-Out" press wash-up method using two special solvents and isopropyl alcohol is described. Used continuously so that the press stays clean, it is possible to change from black to a clean yellow after a single, 3-step wash-up. Proper cleaning of rollers is said to require special solvents that promote the polarization of ink pigment particles.

RUNNING AN OFFSET PRESS. Frank E. England. *National Lithographer* 19, No. 6, June, 1952, Pages 52-3 (2 pages). The author discusses educational requirements for a good pressman, and some offset press problems including roller stripping, cleaning metals, bearer pressure and use of spray equipment.

GRAPHIC ARTS: GENERAL

TRAINING IS THE KEY (Part Two). Lawrence Brehm. *Modern Lithography* 19, No. 7, July, 1951, Pages 43-45 and 109 (4 pages). This part of the paper covers foremen and related training. An opportunity must be provided to make trade information available to the tradesman, to get new methods, equipment, and devices into operation quickly and to improve the caliber of craftsmen. A program for training foremen is described. It includes five sessions on human relations, three on how to instruct, one on work simplification, one on assistant foremen as front-line management, and at Western, twelve more on work simplification. The Related Training Program consists of four units of ten sessions each. Its purpose is to familiarize employees with the entire printing industry to improve their performance of their segment of the work and to improve morale. Teaching material sources are PIA, LTF, NALC, and suppliers. Instructor procurement is a major problem.

PRESSROOM ILLUMINATION. Philip E. Tobias. *Printing Equipment Engineer* 82, No. 1, October, 1951, Pages 40-42 (3 pages). The apparent color or color temperature of a light source, as well as the spectral distribution of the light, will affect the appearance of a printed sheet. The effect may be sufficient to prevent satisfactory judgment even of comparative color and density, Thus, standard fluorescent lights are poor for examining the red end of the spectrum—for example, browns or red-tinted blacks. The physical, areawise distribution and brilliance of the light source have a profound effect upon the apparent optical density of the image on a relatively large press sheet. A lighting unit was designed which apparently is an effective compromise between initial cost, economy of operation, and spectral and areawise distribution.

* HOW DANGEROUS ARE RADIOACTIVE STATIC ELIMINATORS? C. W. Wallhausen. *Am. Paper Converter* 25, No. 10, October, 1951, Pages 14, 34 and 36. The author discusses some of the misconceptions with regard to the industrial use of standard radioactive static elimination devices. He emphasizes that the eliminators constitute a closely controlled source of a very small amount of radioactivity and that, with the proper precautions, hazardous conditions can be avoided. *Bulletin of the Institute of Paper Chemistry* 22, No. 3, November 1951, Page 199. Institute of Paper Chemistry, Appleton, Wisconsin.

* DESTATICIZING PROCESS. *U. S. Patent 2,562,138.* Charles K. Bump and Harold F. Park. *Chemical Abstracts* 45, No. 22, November 25, 1951, Column 10440. Nonconductors, such as glass, wood, paper, and many natural and synthetic org. materials, are rendered resistant to electrostatic excitation for years when placed near radioactive mixts. contg. B or Be. The nonconductor must contain 0.05 parts per 100 of Sb, Zn, Ag, or other metals.

* ULTRAVIOLET-RADIATION IMPERVIOUS WRAPPING MATERIAL. *U. S. Patent 2,580,461.* Irwin A. Pearl. *Official Gazette* 654, No. 1, January 1, 1952, Page 89. 1. A wrapping material substantially impervious to ultraviolet radiations in the range of about 2400 to 3100 A, comprising a base sheet normally pervious to ultraviolet radiations having incorporated therewith a sufficient amount of an ester of 3-methoxy-4-hydroxy-benzoic acid to render said base sheet impervious to ultraviolet radiations in said range.

* A SMALL SCALE AIR CONDITIONING UNIT. O. S. Johansson. *Svensk Paperstidn.* 55, No. 3, February 15, 1952, Page 110 (in Swedish). When testing the influence of different relative humidities on the dimensional stability of paper or board or for similar

work, it is quite often not desirable to change the moisture conditions of an entire room. For this purpose, a laboratory unit was developed which consists of drying and humidifying sections. These deliver dry or moist air currents, as required, to a mixing compartment in which the relative humidity of the air can be adjusted to any value between 5 and 95%; it is accurately controlled by a precision hygrometer. From the mixing compartment, the air of the desired moisture content is fed to the conditioning chamber in which the actual measurements are carried out; rapid changes are possible. 1 illustration. *Bulletin of the Institute of Paper Chemistry* 22, No. 8, April, 1952, Page 559. Svensk Paperstidning is published by S. Blasieholmshamnen 4A, Stockholm, Sweden.

QUALITY CONTROL IN PRINTING PRODUCTION. Donald Macaulay. *American Printer* 133, 4, April, 1952, Pages 25-7, 68, 70-1 (6 pages). Statistical quality control is a scientific technique for determining and controlling the multiple sources of production errors arising from the combined interaction of men, materials and machines. In this article, Mr. Macaulay, pioneer in the application of quality control in the graphic arts, points out that quality control: 1. Should increase quality level, decrease spoilage and rejections. 2. Works as a friend and ally of the pressman and is not a speedup plan. 3. Is a completely separate setup under independent inspection. 4. Most important of all perhaps, tends to recreate in the individual workman a pride in personal accomplishment.

ELECTROPLATING WITH ALUMINUM. Nelson F. Murphy. *Metal Finishing* 50, 4, April, 1952, Pages 76-9 (4 pages). Excellent summary article with references covering the various methods known today of obtaining an Al. coating over a base plate. Coating and electrodeposition from organic baths are discussed.

LIGHT AND COLOR IN THE PRINTING PLANT. Robert W. Dickerson. *Printing Equipment Engineer* 82, No. 8, May, 1952, Pages 31-2, 84, 86 and 88 (5 pages). Proper attention to light *and* color in the printing or publishing plant can produce many satisfying results. Among them are improvement in the quantity and quality of work; more attractive working quarters; more healthful and happy workers and less labor turnover. These qualities have been well demonstrated. The probability exists that equally desirable results may come through the aesthetic approach. It's a challenge which should appeal to the Graphic Arts.

SOME TECHNIQUES FOR PLANT LAYOUT. Ralph B. Tufts. *Printing Equipment Engineer* 82, No. 8, May, 1952, Pages 35-7 (3 pages). A technique for making plant layout work easier is presented. It consists of placing templates of equipment on a scale drawing of the building on a plastic sheet. After arranging the templates, a permanent record is made by exposing Bruning Whiteprint Paper through the plastic.

PROCESSES: GENERAL

* PRINTING MACHINES. British Patent 614,211, Harris-Seybold Co. *Abridgement of Specifications* Group XVI, Page 158. A sheet-fed rotary offset perfecting machine is constructed of a chain 21 provided with grippers 23 for transferring sheets from the impression cylinder 16 of the first offset couple A to the impression cylinder 16 of second couple B. The chain 21 passes over a cylinder 24 and, as the grippers 23 pass around the cylinder 24, the sheet is reversed and taken by grippers 23 on a delivery chain 31 which passes around the impression cylinder 16 of couple B and finally delivers the perfected sheet to a pile 30, the chain 31 being arranged so as to permit access to the inking rollers 9. The transfer chain is arranged to pass under a platform 20 which permits of access to the couple A. The couple A is

so arranged that the line 18 joining the axis of the printing cylinder 14 and impression cylinder 16 is vertical and the corresponding line 19 of couple B is substantially horizontal. The once-printed sheet may be taken from the cylinder 16 by chains 21 passing round a cylinder 24 arranged adjacent thereto, and the chain 21 may pass around the impression cylinder 16 of the second printing unit. British Patent Office, 25 Southampton Buildings, London, W. C. 2, England.

* PRINTING MACHINES. *British Patent 614,023.* F. H. Levey, Co., Inc. *Abridgement of Specifications* Group XVI, Page 156. In a web or sheet perfecting printing-machine the material to be printed is heated before being printed to a temperature high enough to cause quick drying of the ink but below the point at which discolouration of the material would occur, e.g. between 225°F. and 400°F. The ink used consists of a pigment in a vehicle comprising a resin and a solvent which vaporizes rapidly at the high temperature. The web 9 from a roll 14 is led around a heated drum 17 which may be surrounded by a casing 18 with inlet 19 and outlet 20 for heated air. The web is perfected by being passed around impression rollers 5, 6 co-operating with printing rollers 7, 8. The rollers 5, 6, 7, 8 are cooled by circulating fluid from a tank 22 by means of a pump 24 with outlet pipes 25 connected by pipes 26 to the interiors of the cylinders, and return pipes 27, 28 direct the fluid back to the tank 22 which is fitted with a coil 23 for controlling the temperature of the fluid. British Patent Office, 25 Southampton Buildings, London, W. C. 2, England.

* HINTS FOR PROPER MAINTENANCE OF PRINTING EQUIPMENT. C. O. Siebke. *American Paper Converter* 25, No. 5, May, 1951, Pages 12-13. Some suggestions are given on the proper cleaning and lubrication of offset presses to prolong their operating life and to increase their efficiency. 2 illustrations. *Bulletin of the Institute of Paper Chemistry* 21, No. 10, June, 1951, Page 706.

* ELECTROSTATIC PRINTING METHOD AND APPARATUS. *U. S. Patent 2,558,900.* William J. Hooper. Official Gazette 648, No. 1, July 3, 1951, Page 126. 1. A printing couple comprising a rotating type cylinder provided on its circumference with design portions, means for inking said design portions, means electrically grounding said cylinder, guide means cooperatively arranged with respect to said cylinder, means for moving a web of print receiving material in contact with said guide means and in non-pressure contact with the ink on said design portions of said cylinder and at a lineal speed correlated to the relative speed of said cylinder, means operatively associated with said guide means and connected to the positive pole of a high potential electrical source and creating an electrical field of force the lines of force of which extend beyond said guide means to said cylinder and act to transfer ink from said design portions to said web of print receiving material, said guide means comprising a member formed of insulating material and having spaced leg portions one of which contacts said web after the latter has passed out of contact with the ink on said design portions of said cylinder while the other of which is out of contact with said web, the means that is operatively associated with said guide means comprising an electrode element having a free end located intermediate said legs of said guide means and an electrical connection between said element and the positive pole of a high potential electrical source.

* ELECTRIC PRINTING SYSTEM. *U. S. Patent 2,558,901.* William J. Hooper. *Official Gazette* 648, No. 1, July 3, 1951, Page 126. 1. Printing apparatus of the character described, including: a first rotating cylindrical member having at least a portion of the surface thereof coated with ink to be transferred; a web of sheet material; means for moving said web and causing it to pass closely adjacent said coated surface and with at least a portion of one surface of said web in light contact with a portion of

the ink on said coated surface, said contact being insufficient to alone affect the desired transfer; a second rotating cylindrical member, this member having conducting means in engagement with the other surface of said sheet, this means comprising a surface layer of conducting readily resilient material; and means for passing a current through said sheet and the ink in contact therewith.

* MULTICOLOR PRINTING DEVICE. *U. S. Patent 2,566,290.* A. Murray. *Official Gazette* 649, 4, August 28, 1951, Pages 1202-3. A printing device comprises a pack of thin metal plates in regularly recurring sequence, the corresponding plates in each sequence constituting a set, means for moving in their own planes all the plates in each set simultaneously between upper and lower positions, whereby when all but one set are in the upper position the edges of the plates of the one set may be inked, the corresponding edges of all the plates when in the power position lying in a plane and constituting a printing face, the edges of the plates of the several sets carrying inks of different colours and the images of the several sets being complementary colour component images of the same subject and together constituting a multi-colour image of that subject.

MAINTENANCE — THE STORING OF CHEMICALS. C. E. Cosby. *National Lithographer* 58, No. 11, November, 1951, Page 33. The correct methods of storing and handling photographic chemicals is given. Chemicals covered are glacial acetic acid, developing agents, hyporice, sodium sulfite, sodium and potassium bromide, alum, sodium carbonate, developers, and ammonium thiosulfate fixing bath.

* METHOD AND APPARATUS FOR PRINTING ELECTRICALLY. *U. S. Patent 2,576,047.* Roland M. Schaffert. *Official Gazette* 652, No. 3, November 20, 1951. The method of printing consists of moving an electrically conductive support carrying an electrically charged image layer of electrically insulated material through a developing zone in which developer powder with a charge having a polarity opposite to that of the charge on the image layer is electrically deposited on the charged image layer to form a powder image, feeding a transfer material contiguous to the image layer carrying the powder image, spraying an electrostatic charge on the transfer material, stripping the material from the image layer and recharging the image layer.

* GRAPHIC ARTS PROCESS USEFUL FOR SHORT RUNS. *Chemical and Engineering News* 29, No. 50, December 10, 1951, Page 5290. A new graphic arts process called Perma-Stat has been announced by Trans-Gel Products, Inc., Queens Village, N. Y. The process employs an emulsion and makes possible the reproduction of anything that is photographed, written, drawn, or printed onto plastic, metal, wood, glass, leather, or any other nonporous surface, according to the announcement. The emulsion, which is a dichromate stabilized gelatin, is applied to the material to be reproduced. The copy is photographed and the negative placed against the treated surface. Because the emulsion is sensitive only to concentrated ultraviolet rays, the negative is exposed briefly to a carbon arc lamp or an ordinary sun lamp. The final step is a dip into the dye of the desired color, followed by a quick rinse in clear, cold water. Any number of colors may be perfectly registered in sharply detailed form. Because there are no plates or screens involved, Perma-Stat is economical for short-run reproductive process, the report states. Further information about this item (CS4) can be obtained from Readers' Information Service, Chemical and Engineering News, 332 W. 42nd St., New York.

PHOSPHOR-TYPE PHOTO-CONDUCTIVE COATINGS FOR CONTINUOUS TONE ELECTROSTATIC ELECTROPHOTOGRAPHY. Eugene Wainer. *Photographic Engineering* 3, No. 1, 1952,

Pages 12-22 (11 pages). Several processes and methods for "dry photography" are analyzed and compared and the current terminology is given. The highly specialized characteristics required of photo-conductors for use in reproduction work are outlined and comparisons made of the various available conductors. Early work on the theory of photoconductive reproduction is outlined and a description given of the selenium process. Experimental work on the selenium process led to the study of phosphors as photoconductors. Theoretical study, confirmed by experimental results, indicates the commercially available phosphors could be used but were too slow, yielding speeds of about 1 A.S.A. The Carlson process of electro-optic photography, using specially doped cadmium sulfide develops speeds as high as 30 A.S.A. was developed from the above experiments. The Kallman process is also described in detail, with emphasis on field use and general adaptability. Graphs which are included give the comparative results to be obtained from various phosphors.

SILK SCREEN MAKES STRIDES WITH MECHANIZATION. J. I. Biegeleisen. *Lithographers Journal* 36, No. 10, January, 1952, Pages 19 and 35 (2 pages). Recent developments in silk screen printing are discussed. Several automatic and semi-automatic presses are now available as well as dryer machines which can dry prints in about 8 minutes.

NEW COLOR PROCESS. Ralph S. Bing. *National Lithographer* 59, No. 1, January, 1952, Page 38. A description of the Craftint Multicolor Process for making hand color separations. The process consists of a set of three sheets of translucent film in which two different screen patterns, one a dot and one a line, are invisibly processed. By brushing the films with a special developer, the various tones appear in the films and are then used to make photographic negatives for platemaking.

* ELECTROSTATIC REPRODUCTION. *U. S. Patent 2,584,695.* Paul J. Good. *Chemical Abstracts* 46, No. 9, May 10, 1952, Column 3884. An apparatus is described which will produce reproductions of plane images onto sheet material in black and white or full color, without the use of a photochem. process. In practice a beam of light is projected on the original which is scanned as it moves past a lens system and photocell. The photovoltaic currents are amplified and fed into an electrode in contact with the reproduction sheet which is moved in synchronism with the original. Dye from a spray nozzle directed at the side of the reproduction sheet directly opposite the electrode will variously be attracted to or repelled from the sheet, depending on the charge induced in the electrode, and thus produce an image. By using several filtered photocells, each controlling atomizers contg. dyes of the appropriate hues, fully colored prints may be obtained.

* PRINTING PROCESS WHEREIN AN ALKALINE SUBSTANCE PASSING THROUGH STENCIL OPENING EFFECTS COUPLING OF AN AZO DYE IN SITU. *U. S. Patent 2,597,306.* Samuel E. Eaton and Robert W. Fabian. *Official Gazette* 658, No. 3, May 20, 1952, Pages 771-2. 1. A process of printing which comprises applying to a support a diazo compound capable of yielding a dye when coupled, and a coupler for the diazo compound the reaction of said compounds being inhibited by acid, and an acid, said acid being present in an amount at least sufficient to prevent immediate coupling of the diazo compound, exposing the support through a stencil to sufficient alkali to cause coupling of alkalized diazo component and said coupler, and fixing the uncoupled compound.

FERROMAGNETOGRAPHY — HIGH-SPEED PRINTING WITH SHAPED MAGNETIC FIELDS. T. M. Berry and J. P. Hanna. *General Electric Review* 55, No. 4, July, 1952, Pages 20-2 and 61 (4 pages). A brief description of

Ferromagnetography — a process of printing by forming magnetic images — in a thin sheet of permanent magnetic material, and then making the images visible by dusting with tiny ferromagnetic particles.

RESEARCH AND DEVELOPMENT

• THE PROTECTION AGAINST CORROSION BY PHOSPHATIZATION. Josef Muller. *Chemie* (Prague) 5, 17-21 (1949). Fe sheets pickled in Mn phosphate resisted corrosion in 3% NaCl, in a saline mist, and in a wet atm. better than sheets pickled in phosphates of Zn or Fe. The slow pickling process with Mn formed a thick layer of coarse granules which should be protected further with a heavy oil. The rapid process produced by Zn yields a thin layer of fine grains which should be protected further by a layer of lacquer. Zn or Mg can be protected against corrosion by the identical process. Cu can be protected if the surface is covered by a film of Fe before it is immersed in the phosphate solution, *Chemical Abstracts* 46, 6, March 25, 1952, Columns 2468-9.

• CORROSION OF METALS. METALS UNDER STRESS. I. ALUMINUM. P. F. Thompson. *Australia, Supply Department, Aeronautical Research Consultative Committee Report ACA-49* (1950). Simultaneously determined time-potential curves are presented for stressed and unstressed electrodes of pure Al; test pieces of various shapes were used, but the dimensions of the stressed portion, while modifying the ultimate stresses made little difference to the electrode potentials. Effects of aeration and deaeration of tap and salt water were determined for short- and long-period applications of increasing stresses. Immediately on increase of stress, sudden inflections were observed in the curves, presumably indicating film rupture or breakdown, and gradually increasing in magnitude until fracture took place. Film regrowth was indicated by the potential curve becoming more positive. The "recovery" curves quickly returned to the original potential value of the test piece, but the curve's shape was affected by the nature of the liquid. Shock effects increased the amplitude of inflections. Increasing stresses in hardened Al had little effect on the potential curve until fracture was imminent. Chemical solution of compounds, e.g. oxides, containing undissociated ions segregated at grain boundaries and elsewhere, followed by corrosion in cavities so produced, may provide points at which stress effects can be concentrated. These experiments indicate that stresses are only contributory factors in so-called "stress-corrosion." *Chemical Abstracts* 46, 5, March 10, 1952, Column 1947. *Chemical Abstracts* is published at 1155, 16th Street, N. W., Washington, 6, D. C.

• NEW POLYMERS HAVE REMARKABLE ADHESIVE PROPERTIES. *AMINCO Laboratory News* 8, No. 5, September, 1951, Page 8. Metals, ceramics, and glass can be adhered to themselves or to other materials such as wood, cloth, synthetic rubber, and paper, by the recently introduced Pylene adhesives. Pylene resins are available as powder, pre-polymer liquids, and as solvent solutions and can be supplied in one part containing catalysts already incorporated, or as two parts to be mixed prior to use. Some grades can be converted to very hard and tough plastics without the use of heat, while others can be polymerized only by heat. In addition to their unusual bonding properties, Pylene resins are resistant to solvents, chemicals, abrasion, and heat, and are virtually unaffected by aqueous acids or alkalies, gasolines, oils, and many other solvents. They are tough and horny plastic materials when set, and can resist abrasion and vibratory forces. Bonds made with Pylene adhesives have high dielectric strength and volume resistivity. Further information may be obtained from Polymer Industries, Inc., 11-08, 30th Ave., Astoria, N. Y., or Polymer Southern, Inc., P. O. Box 2184, Greenville, S. C.

KODAK RESEARCH IN THE GRAPHIC ARTS. Walter Clark. *Photo-Engravers Bulletin* 41, No. 4, November, 1951, Pages 51-57 (7 pages). A brief history of the Kodak Research Laboratories in Rochester, N. Y., which now employs a staff of over 600. The graphic arts section of the laboratory is discussed in greater detail, reviewing some of the work which has already come out of it on photographic aspects, such as the contact screen, color correction techniques, electro-optical scanning machine for making color-corrected separation negatives, and the fluorescence processes. Active research is now being carried on some of the problems of printing itself. These studies include basic problems of "printability" and the "theory of tone reproduction". Also mentioned is the current work on a plastic printing plate called the Ektalith plate which is intended for use in a system designed to permit high quality color reproduction for runs of about 5000 on offset duplicators. A new photosensitive system employing polymers which are light-sensitive in themselves and which make it possible to presensitize and store metal plates is now in the experimental stage. Work is also being carried on in the preparation of photographic silk screen resists.

* PROCESS FOR PRODUCING AN INK-RECEPTIVE SURFACE ON TRACING CLOTH. *U. S. Patent 2,576,-921.* John H. Buscher. *Official Gazette* 653, No. 1, December 4, 1951, Page 71. A process for producing an ink-receptive but non-abrasive surface on tracing cloth, which comprises treating such material with a mixture of about two grams arrowroot starch, one ounce gelatin by weight, one-fourth ounce alum by weight, one ounce alcohol by volume, one ounce formaldehyde by volume as 37% formalin and water to make one quart, and drying the thus-treated tracing cloth.

TRANSPARENT PROOFING. Ernest F. Trotter. *Printing Magazine* 76, No. 1, January, 1952, Pages 54-6 and 76 (4 pages). Continuing research of the ITCA group approves the GPO report on transparent proofing but favors Lumarith (0.002" thick) over Ethocel.

* THE PASSIVATION OF TIN-PLATE. W. Eilender. *Werkstoffe und Korrosion.* 2, 8, Pages 289-92. Passivation of tinplate was tried with various agents. Chromate solutions were found to be the best but required the addition of wetting agents. *Metal Finishing* 50, 3, March, 1952, Pages 73-4. Werkstoffe und Korrosion is published at Bergstrasse, Weinheim, Germany.

TESTING AND MEASUREMENT

* WETTABILITY AND METHODS FOR ITS MEASUREMENT. K. Schultze. *Kolloid-Z.* 121, 1951, Pages 57-65. Several methods are described to determine the wettability of the surface of materials like paraffin and other waxes. All the methods are based on the gradual transfer of a drop of water, the size of which is reproducible, to the surface to be measured. The drop of water is formed in the Pt ring of a surface-tension-measuring instrument. The ring, 3 mm. inside and 4 mm. outside diameter, with the water drop, is lowered to touch the surface, then by lifting it part of the drop is transferred to the surface The force required to lift the ring from the surface is measured; then the ring with the remaining part of the drop is lowered to another part of the surface, and the process is repeated until all the water is transferred. The number of contacts required is a measure of the wettability of the surface and is designated as the β number. The higher this number, the less wettable the surface. The weight of the water transferred at each contact is another measure of the wettability; this is in inverse proportion to the β number. A third measure of wettability is the force, expressed in mg., required to lift the Pt ring from the surface. By this method, Schultze gives quantitative data to show the differences of paraffin surfaces treated in

various ways. The surface of paraffin solidified in contact with water is wetted readily and gives a number of 2 to 4. A paraffin surface remelted by sweeping it with a flame has a number of 40. Values are also given for ceresin, ozocerite, and other materials. *Chemical Abstracts* 45, No. 16, August 25, 1951, Column 6897. American Chemical Society, 1155, 16th Street, N. W., Washington 6, D. C.

* FILMETER—COATING THICKNESS GAGE. *AMINCO Laboratory News* 8, No. 6 November, 1951, Page 11. Measures, by non-destructive electrical means, the thickness of non-conducting (insulating or non-metallic) coatings deposited on non-magnetic base metals. Coatings may be paint, enamel, plastics, ceramics, or anodic and the like, and the base metal may be aluminum and its common alloys, also brass, copper, bronze, and magnesium. Thickness range, 0 to 0.005 inch with an accuracy of 3% of full scale, and 0 to 0.001 inch with an accuracy of 5% of full scale. By throwing a switch, one range can be changed to the other. Will not mar or destroy the coating or the base metal. Measures coatings on flat, convex, or concave surfaces. Less than 30 seconds required to take a reading. No special training or experience required to operate. Readily portable; weighs only 11 lbs. Self-contained, operated by standard dry batteries. Accuracy of the instrument is unaffected by reduced battery strength. Requires no external source of power. May be used as a portable field instrument or on a laboratory bench. For further details, write for Bulletin N-2150, American Instrument Company, Inc., 8030-8050 Georgia Avenue, Silver Spring, Maryland.

TONE AND COLOR

COLOR TOLERENCE SPECIFICATIONS FOR PAINT. Thomas F. Boyd. *Journal of the Optical Society of America* 41, No. 8, August, 1951, Pages 552-557 (6 pages). As a basis for preparing color specifications for paints, a study was made of observers and conditions in relation to grading color differences and selecting tolerances for a green paint. Simple color difference formulas gave correlation with visual observations as good as or better than complicated formulas. There was no appreciable difference between results under north daylight and an artificial source of north daylight. Color requirement limits determined by inexperienced observers were about the same order as for experienced observers. The study indicates that in many cases it may not be necessary to prepare a very large number of colors in the preparation of color specifications. Time was saved in the present study by the use of one-dimensional color series to determine color requirement limits.

* COLOR AND COLOR DIFFERENCE METER. *U. S. Patent 2,574,264.* Richard S. Hunter. *Official Gazette* 652, No. 1, November 6, 1951, Page 235. 1. In a color and color difference meter, means for supporting a specimen, a comparison photocell, a light source for illuminating a specimen and said comparison photocell, a diffusion chamber receiving light from a specimen positioned on said specimen supporting means, a plurality of photocell means provided with filters of different tristimulus characteristics, said diffusion chamber being provided with openings through which light is transmitted to the several photocell means, and a measuring circuit network for measuring the equivalent gray value and the chromaticity of the specimen on three scales of substantially uniform perceptibility; said measuring circuit network including switch means adjustable to establish a desired one of three measuring circuits which each include a selected photocell means and a potentiometer adjustable to balance the current output of the selected photocell means by a fraction of the current output of said comparison photocell; each potentiometer having indicating means including

a scale graduated in 100 units, and the relative areas of the several openings being different and so related that the scale reading of each potentiometer at balance condition is a numeral value, on a scale of substantially uniform perceptibility, of a color attribute of the specimen.

*ELECTRICAL MEANS FOR REPRODUCING PHOTOGRAPHS. *U. S. Patent 2,572,550.* D. D. White and F. R. Osborn. *Photographic Engineering* 3, No. 1, 1952, Page 56. The patent covers a new and novel method for the reproduction of black and white and color photographs, whether transparencies or otherwise, by deposition of dye, pigments or other coloring matter upon a receiving surface, the deposition being controlled by a modulated electric current or voltage. The coloring matter is supplied at zero or insignificant pressure and is attracted to and deposited onto the receiving surface by the action of an electric field. The method for doing this comprises three steps: (1) Supplying coloring matter at zero pressure to a device adjacent the desired receiving surface. (2) Setting up an electrical potential gradient between the device and the receiving surface so as to attract particles of coloring matter from the supply device, to disintegrate the particles and to deposit them on the surface. (3) Varying the intensity of the potential gradient so as to vary the intensity of the deposition. When reproducing photographs and the like, the original is scanned with a beam of light which subsequently impinges on a photo-electric cell. The output from the photo-electric cell is amplified in an amplifier whose output controls the intensity of the potential gradient. The receiving surface and the device are moved relatively in synchronism with the scanning of the original with the result that the deposit of coloring matter on a particular point on the receiving surface is in accordance with the light values of the corresponding point in the original. When the device is used to reproduce a color photograph such as a transparency, the original is scanned with three different colored beams of light impinging upon different photo-electric cells and the amplified output of the photo-electric cells modulates the potential gradients between the receiving surface and different ink sources. The inventors state in their patent that there is described and claimed apparatus which may be employed for effecting the method of this invention in their U. S. patent application, Serial No. 746,174, filed on May 5, 1947.

*PHOTOGRAPHIC IMAGES BY ELECTRONIC OR IONIC BOMBARDMENT. *U. S. Patent 2,549,546.* Albert G. Thomas. *Photographic Engineering* 3, No. 1, 1952, Pages 56-7. Thomas' invention relates generally to devices for recording images and particularly to electronic copying or reproducing devices. One of the objects of Thomas' invention is to provide a copying device in which reproductions of a letter, drawing, or light- and shadow image of any kind are permanently made in or on a sheet of paper or other material by ionic bombardment. Another object is to provide a camera in which pictures are made electronically, without chemical baths or the like. A further object is to provide an electronic reproducer or copying device in which electron images are passed through a thin metal element to affect a sheet of material adjacent the thin metal element. Another object is to provide an electronic reproducer in which the image is formed by a scanning sequence. A still further object is to provide special paper or film sensitive to electronic or ionic bombardment. The paper for these devices may comprise an elongated sheet of any suitable material which is sensitive to ionic or electronic bombardment. The principles disclosed in this patent can be used for making copies of drawings, letters and the like, as well as to photograph scenes or live objects. In this connection, Thomas refers to U. S. 2,409,454 "Electronic Device", issued to him October 15, 1946.

Examination of this patent discloses that it also covers a reproducer for copying letters, maps, drawings, photographs and the like. The present patent apparently covers refinements to the prior patent and is also somewhat more extensive.

LIGHT SCATTERING IN HALFTONE PRINTS. Francis P. Callahan, Jr. *Journal of the Optical Society of America* 42, 2, February, 1952, Pages 104-5. Light scattering plays a part in determining the colors of a halftone print. By treating the print as a filter in contact with a scattering medium and ignoring second-order effects, approximate equations are derived which enable an upper limit to be set on the error resulting from the use of the Neugebauer equations in the usual way. The error is found to be no more important than the other errors associated with their use.

LIGHTING FOR BETTER COLOR QUALITY CONTROL IN THE GRAPHIC ARTS. W. B. Reese. *Modern Lithography* 20, No. 4, April, 1952, Pages 45-48 (4 pages). The problems encountered in the choice of the light used for illumination of flat copy, ink matches, and color transparencies are discussed. The characteristics of some of the available incandescent and fluorescent lamps and the use of filters are described.

SKILLED CRAFT TEXTS

501 Lithographic Offset Press Troubles
502 Offset Platemaking (albumin)
503 Offset Photography—(Line)
504 Offset Platemaking (Deep Etch Gum Process)
505,6 Lithographic Offset Press Operating, 2 Volumes
507 Offset Stripping (Black and White)
508 Offset Photography (Halftone)
509 Offset Photography (Color Separation)
510 Tone and Color Correcting (Dot Etching)
511 Tone and Color Correcting (Hand Retouching)
513 Lithographic Press Technical
514 Tone and Color Correcting (Opaquing)

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103 Albumin Platemaking
104 pH Control of Fountain Solutions
105 Inking System for the Offset Press
106 Lithographic Offset Press Blankets
107 Feeder and Delivery for Offset Presses
108 The Dampening System of Offset Press
109 Guides, Grippers and Insertion Devices
111 Offset Plates in the Pressroom
112 Offset Photography (Line)
113 Inks for Offset Lithography
114 Packing and Pressures for Presses
115 Press Cylinders for Offset Lithography
116 Offset Photography (Color Separation)
117 Hand Transfers for Offset Lithography
119 Gauges and Instruments for Offset
120 Photo-Composing for Offset Lithography
121 Tone and Color Correcting (Retouching)
122 Proving for Offset Lithography
123 Platemaking for Offset (Deep Etch)
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125 Paper for Offset Lithography

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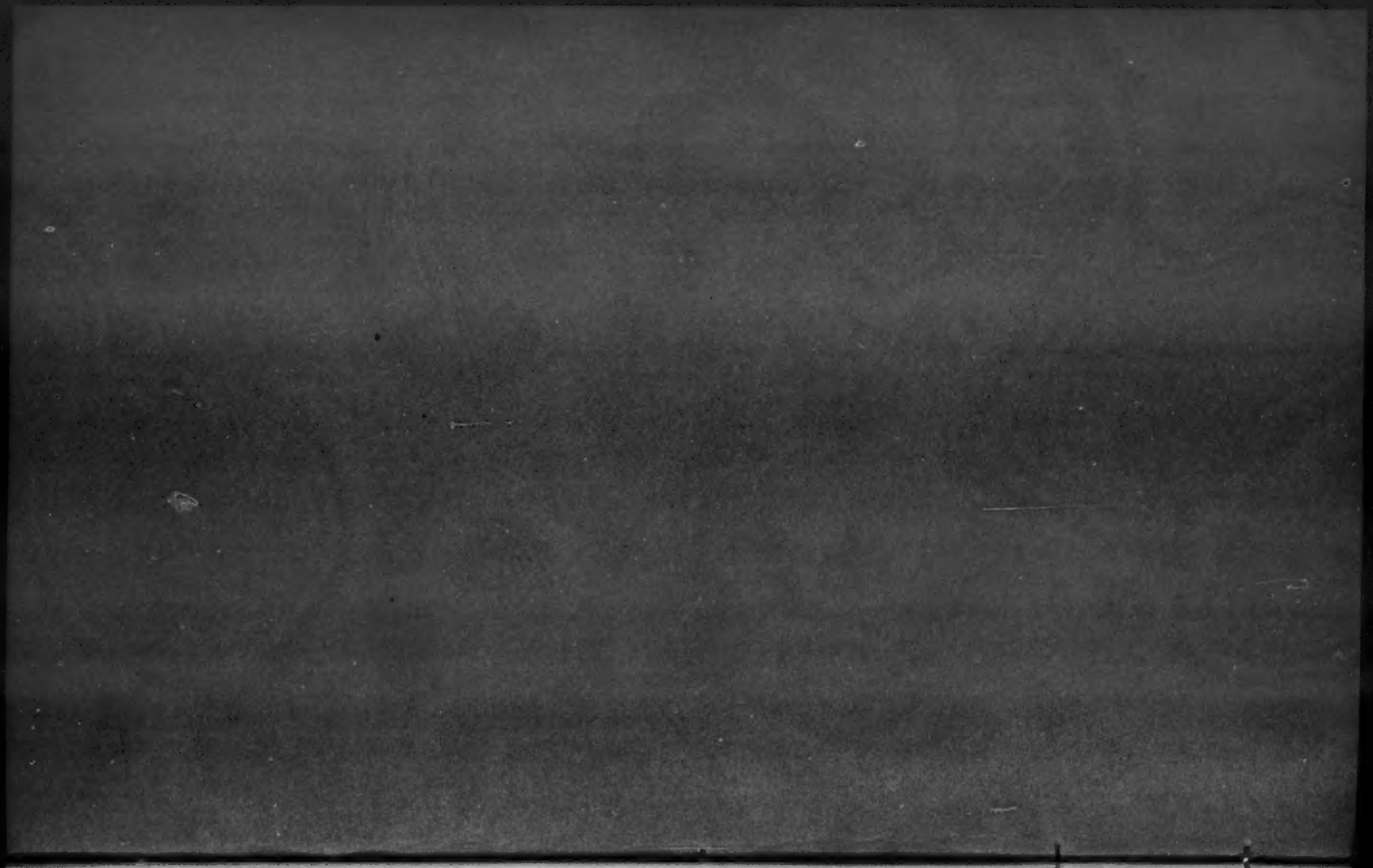
126 Paper Conditioning for Offset Lithography
127 Pressroom Problems
131 Plate Troubles in Offset Lithography

SPECIAL SUBJECT TEXTS

403,4 Chemistry for Lithographers, 2 Volumes
407 Survey of Lithography
410 Estimating (Black and White)
411 Estimating (Color)
413 Leadership Training

RESEARCH AND TECHNICAL PUBLICATIONS

211 Dot-Etching on Dry Plates and Films
212 Litho-Kleen, Improved Treatment for Blankets and Rollers
213 The Drying of Lithographic Ink
214 Improvements in Deep-Etch Platemaking
215 Sensitivity Guide
216 A Method of Designing and Making Contact Screens
217 The Standardization of Graining Procedures
301 Modern Paper Conditioning Methods and Paper Hygroscope
303 Method of Conditioning Paper for Multi-Color Offset
304 Optical Density as a Measure of Tone Value in Lithography
305 Dot Area, Dot Density, and Tone Value
306 Prevention of Occupational Dermatitis (Chrome Poisoning)
307 Curling of Lithographic Papers
308 What the Lithographer Should Know About Paper
309 Air Conditioning for Lithographers
318 The Measurement of Offset Blanket Thickness
647,51 Lithographic Abstracts (Annually from 1947)
701 The Control of Tone Reproduction in Lithography
702 Reproduction of Tones by Offset Lithography
801 How to Make and Run Better Plates
802 Plate Surface Treatments
803 pH, What it is, How to Measure it, Where to Use it
904 The Register Rule
SB1 The Paper Hygroscope

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